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# American Journal of VETERINARY MEDICINE

Vol. XV AUGUST, 1920 No. 8

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E R Alexander

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VOL. XV. AUGUST, 1920 NO. 8

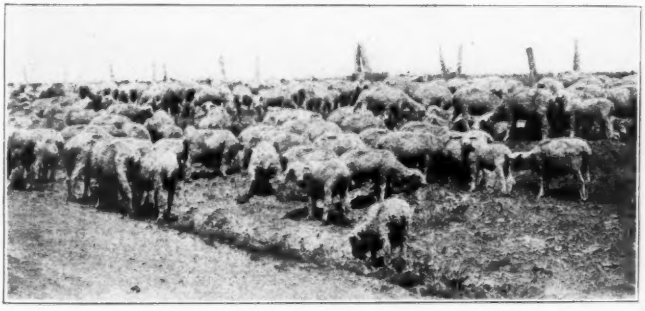
# Sheep Diseases in Montana

By HADLEIGH MARSH, Helena, Montana

Pathologist and Bacteriologist, Live-stock Sanitary Board Laboratories

A DISCUSSION of sheep diseases in the state of Montana will apply in a general way to the whole range country of the West, but will include certain conditions which are more or less peculiar to Montana and the Northwest. In this paper we shall consider particularly those conditions which have been brought to our attention most prominently in Montana, and no attempt will be made to cover the whole range of sheep diseases. While it might appear that the interest in such a discussion would be only local, it will be found advantageous by the veterinarian located in any part of the country to study animal diseases in relation to geographical distribution and agricultural conditions in other states, as in these days there is so much movement of both men and live stock from one section to another.

As the disease conditions which are the most important in any region depend to a great extent on the methods of handling stock in that part of the country, we shall first discuss briefly the conditions under which sheep exist in Montana, due to the particular methods used in the sheep industry in that state.



Baker's Sheep Diseases.

Leaving the home ranch in May or June, the band of 2,000 or 3,000 sheep and lambs slowly trails to the forest reserve.

*Read at the Missouri Valley Veterinary Association Meeting, Omaha, Neb., July 12-14, 1920.

### Sheep Industry Strictly Range Proposition in Montana

The sheep business in Montana is strictly a range proposition, with winter feeding of hay, except for a comparatively small number of sheep that have been fed beet tops and pulp in connection with the manufacture of sugar at the factory at Billings. This is in contrast to Colorado, for instance, where a million lambs are handled in feed-lots in the Platte and Arkansas Valleys, and where several hundred thousand lambs are fattened in the pea-fields of the San Luis Valley. In Montana there is no feeding on a large scale, and this fact eliminates from our important diseases those disorders due to forced feeding and high protein concentrates and also certain infections to which feed-lot conditions are favorable. On the other hand it brings into prominence the poisonous plants and certain infectious and parasitic diseases which prevail on the range. The custom of herding sheep in bands of 1,000 to 3,000, and trailing these bands from winter to summer range and back, creates conditions which make them liable to eat poisonous plants in considerable quantity. They clean up the range as they move, and on account of being more or less closely herded, they eat the poisonous weeds after the grass has been cleaned up. Or in moving to a strange range, they pick at certain poisonous plants, like the lupine, before they get used to the new conditions. As dogs always accompany range sheep, and coyotes are usually on the range, there is opportunity for perpetuating certain parasites whose life history is completed in the dog.

It is also a consequence of the range method of handling sheep, that the Montana veterinarian has not given as much of his attention to sheep diseases as he would be obliged to if sheep were finished on a large scale in that state. When sheep are on the summer range they are more or less inaccessible to the veterinarian, and until recently, the value of an individual sheep was not sufficient to make the loss of a few head of any great importance to the owner.

We shall discuss briefly the principal diseases which occur among sheep in Montana, grouping them under plant poisoning, parasitic diseases, and bacterial infections. It is not our intention to go into detail in regard to any one disease, particularly as we have nothing new to present, but rather to give a general idea of the scope of the subject, especially in its relation to our peculiar conditions.

### Poisonous Plants Cause Greatest Losses

It is our opinion that greater losses among sheep in this state—and this is probably true of the range sheep business in the other western states—are caused by

Baker's Sheep Diseases.

**Sheep killed by lupine poisoning.**

plant poisoning than by any other class of diseases. Veterinarians as a rule are not well acquainted with poisonous plants that occur on the range, and with the symptoms and lesions produced by them, and we believe that hemorrhagic septicemia or some other infectious disease is often blamed in the case of both cattle and sheep when the true cause of the trouble is plant poisoning. In most cases treatment of sheep for plant poisoning is of little value, but the ability to recognize the symptoms of the different forms of poisoning and to recognize the plants that cause them, together with some knowledge of the distribution of the plants and the means of avoiding poisoning, is of great importance in the prevention of such losses.

### Loco Causes Great Losses

The three poisonous plants of the greatest importance to the sheep industry in Montana are loco, lupine and death camas.

The loco is a leguminous plant which grows in great abundance in certain sections of the state, particularly east of the main range of the Rocky Mountains. It has been the cause of great losses to the sheepmen as well as to owners of horses and cattle. Overstocking and close grazing of the range by sheep has caused the loco to take the place of part of the grass, and sheep have fed on it because of the shortage of other feed, particularly in dry years. Animals acquire a habit of eating this weed, and a chronic poisoning results, causing nervous disorders, emaciation, and finally death. This condition is met on the spring and fall range, as there is little loco as a rule in the mountains where most of the sheep go for summer range.

### Lupine Poisonous Under Certain Conditions

There are several species of lupine in Montana, all of which are poisonous under certain conditions. They grow in great abundance in the foot hills, and at times take heavy toll from bands of sheep that are trailed through these areas. This plant contains an alkaloid, lupinin, which causes acute poisoning and death when ingested in sufficient quantity. The alkaloid is concentrated in the seed when the plant is mature, and when the sheep are brought out of the mountains in the fall, trailing over a country where lupine is very abundant, very heavy losses ensue. On the other hand, sheep may be grazed all summer where lupine is thick, without any loss. In fact, this plant is often cut for hay before seed time. Losses from this plant can be avoided by intelligent handling of the sheep in regions where it grows in large quantity. After shipping on the railroad or after a long drive with little feed, sheep should not be grazed where there is much lupine, even before it seeds. When sheep are being driven out of the mountains in the fall, heavy growths of lupine should be avoided if possible, but where this is not possible, the band should be allowed to drift slowly across such an area, so that they will feed normally and not eat a disproportionately large amount of lupine. Herders often hurry their bands across an area that is considered dangerous, with the result that the sheep, especially lambs, pick off the lupine tops because they are the most accessible forage when the animals are hurried.

Baker's Sheep Diseases.

Band infected with sheep scab.

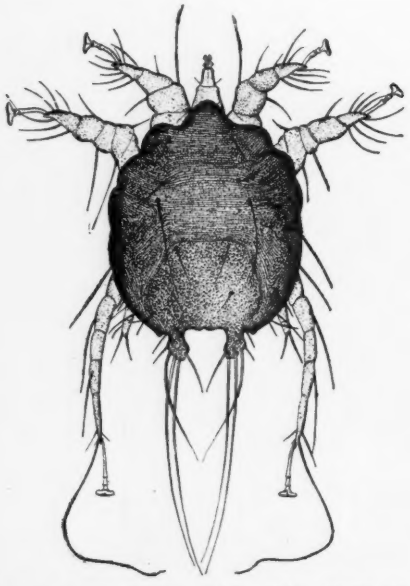
### Death Camas in Mountainous Regions

Death camas is the name applied to several species of Zygadenus, a genus of liliaceous plants which is distributed quite generally throughout the mountainous regions of the West. In some places this plant grows quite thickly, and when sheep are herded on these areas in the spring, often a great many are poisoned, with a considerable percentage of deaths. This plant also contains an alkaloid, zygadenin, which causes an acute poisoning.

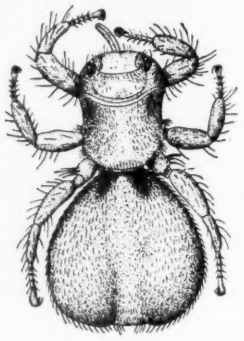
These three groups of forage plants are generally distributed and cause a very large percentage of the losses due to plant poisoning, although there are probably several other plants, such as the laurels and wild cherry, which occasionally kill sheep in Montana.

### Parasitic Diseases Reduce Wool and Mutton Yield

In common with the other western states, Montana has to contend with many animal parasites of sheep, both internal and external. While the injury due to parasites is not always easily recognized, and in some cases is rather indirect than direct, nevertheless it is evident that wherever parasites of any kind are harbored in any considerable numbers, the yield of wool and mutton is reduced sufficiently to cause a very marked loss in the aggregate.



Sheep scab mite (*psorptes ovis*). Male. Dorsal view, greatly enlarged. (Salmon and Stiles, 1898.)



Sheep tick (*Melophagus ovinous*). Male. Dorsal view, greatly enlarged. (From Curtice, 1890.)

Of the diseases caused by parasites, scabies has in the past probably caused the most loss to sheep men. At the present time, this disease does not exist in Montana, and by the enforcement of our sanitary control regulations, it is hoped that we may keep the state free from this scourge.

While we are free from the scab mite, the wool of the sheep harbors another parasite, the sheep tick, which is widely distributed, and occurs in large numbers on sheep, especially the coarse wool or mutton breeds. While a mature sheep may be the host of the sheep tick without any very apparent ill effect, it is believed by authorities that the irritation and loss of blood due to the ticks cause a very serious decrease in the flesh and wool produced. This is especially true in the case of lambs. It would pay the sheepmen of the Northwest to make a practice of dipping sheep for ticks, and eventually rid the country of this parasite, as has been done to a large extent with the scab mite.

In parts of Montana, infestation with *Oestrus ovis*, or "grub in the head," causes a great deal of loss in condition in large numbers of sheep, although the fatalities from this cause are not many. Sheep suffering from this condition are often confused with "locoed" sheep, as they become emaciated and, due to the extreme irritation caused by the presence of the larvæ in the nasal passages, show symptoms that

Estrus ovis. a. Adult female. b. Adult male.

could easily be referred to nervous disorders.

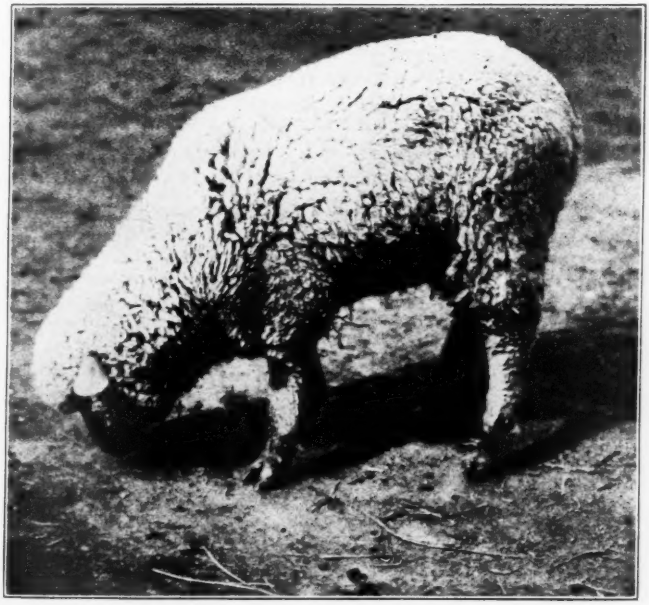
Parts of Montana have in past years suffered considerable loss from the disease known as "gid," caused by infestation with the cysticercus stage of the dog tapeworm, but for several years this disease has not been reported. Where it existed, the herders' dogs, as well as the coyotes, harbored the adult tapeworm, and completed the life history of the parasite. Where dogs were prevented from feeding on heads of sheep which died of the disease, and were treated with anthelmintic to rid them of the tapeworm, the amount of gid in the sheep was greatly reduced.

In common with the other western states, most of our sheep are more or less infested with the fringed tapeworm, *Thysanosoma Actinioides*, which has caused a very considerable loss in lambs. Mature sheep seem

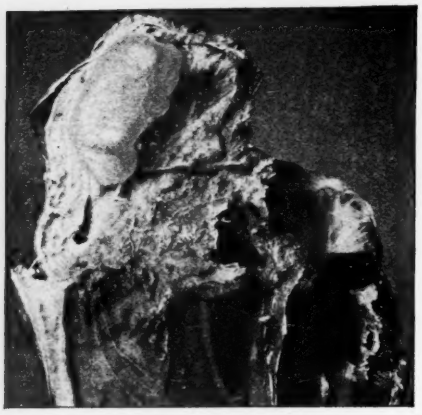
Baker's Sheep Diseases.
Brain showing cyst of gid parasite.

to carry this parasite with impunity. At the present time the life history of this parasite is not known; therefore we are handicapped in any attempt to control its spread.

Lung worms and stomach worms, which are of great importance as sheep parasites among sheep on the farms farther east,



Baker's Sheep Diseases.
Sheep affected with gid.

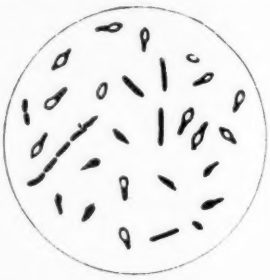


Baker's Sheep Diseases.
Section of sheep brain showing gid worm projecting from center of brain.

have not been recognized as occurring to any great extent in Montana sheep. Pneumonia due to lung worms has been found, however, in several cases, where many lambs were affected.

### Infectious Diseases Not Numerous

The infectious diseases of bacterial origin with which we have to contend in Montana are not numerous, as far as is recognized at the present time, nor are there any great losses from bacterial sheep diseases. The most important disease of this group is lip-and-leg ulceration, a form of necrobacillosis, which is somewhat peculiar to Wyoming and Montana. Certain parts of Montana suffer losses nearly every year from this disease, although the number of sheep affected varies greatly from year to year according to conditions of weather and feed. The infection always starts in the winter, when the feet and mouths of the sheep are abraded by the crust on the snow and by frozen feed, or when they are fed in muddy or frozen meadows. It is very striking that well fed sheep, kept under the best conditions, have a great deal of resistance to infection with the necrosis bacillus. While in many cases lip-and-leg ulceration has caused a big loss to sheep men, it does not always assume a malignant



Blackleg Bacillus.

form, and may heal spontaneously. In bands where it becomes malignant, it may be checked by proper isolation and by careful local treatment of the lesions. The local treatment most used has been the application to the affected part of nitric acid, diluted with seven parts of water. In the last few years the number of sheep affected with lip-and-leg ulceration has not been large.

Baker's Sheep Diseases.
Lip-and-leg ulceration.

Another infectious disease which has not been generally recognized as occurring in sheep, is blackleg. We have no data to indicate that sheep have been affected to any great extent by blackleg in Montana, but it is possible that there is considerable loss from this disease without its being recognized. This statement is made in view of the fact that the state veterinarian's office recently had occasion to investigate a loss in a band of bucks, which was proved by laboratory examination to be blackleg. This was reported in the *Journal of the American Veterinary Medical Association* for

December, 1919. We are still carrying the cultures in the laboratory, and they are running true to form, corresponding exactly to cultures recovered from cattle. It may be that for some reason sheep are less susceptible to blackleg than cattle, and that the occurence of this disease in sheep is rare. In the case that we studied, a predisposing cause existed, in that the bucks had been fighting over a ewe which had strayed into the band, and were badly bruised.

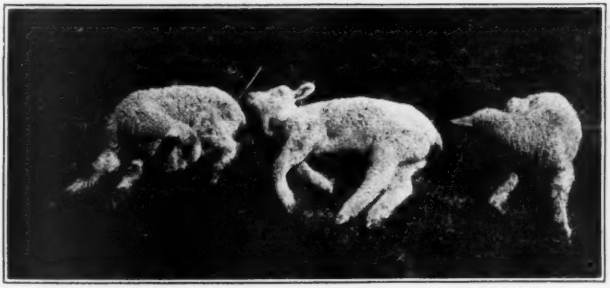
So far as we know there are no other infectious diseases causing any considerable loss in this state at the present time. Occasionally there have been cases of malignant edema following shearing, and there may be some other infections occurring which have not been brought to our notice.

Baker's Sheep Diseases.
Lip-and-leg ulceration, showing lip lesion.

### Range Cattle Free From Hemorrhagic Septicemia

In connection with the discussion of the bacterial infections, it should be said that that very popular disease, hemorrhagic septicemia, apparently does not occur to any extent in sheep in Montana. It is our belief that the diagnosis of hemorrhagic septicemia is made far too often in the various species of animals, and that even laboratory diagnoses are made on the finding of pathogenic bipolar gram-negative bacilli which does not warrant the diagnosis of hemorrhagic septicemia. Probably this disease seldom occurs among sheep handled under range conditions, while in the feed-lots in Colorado Dr. Newsom has found hemorrhagic septicemia causing very considerable losses.

Under the heading of infectious diseases we will mention two conditions of which the cause has not been determined, but which may be infectious. One of these is "big head," which occasionally occurs in this state, although it is more common in Idaho and Utah. The other is a peculiar condition affecting sheep, which are called "lungers," by sheep men. It has been described by veterinarians as "progressive edematous pneumonia." It is a chronic pneumonia affecting mature sheep, and terminating finally in death. The cause has not been determined, although some investigation has been carried on. This chronic pneumonia has been observed by veterinarians and sheep men in several parts of the state. It occurs among old ewes rather than in lambs and wethers.



Baker's Sheep Diseases.
Sheep killed by hemorrhagic septicemia.

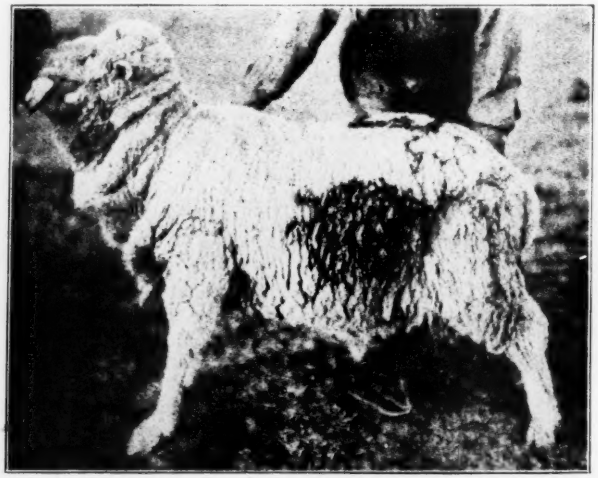
and always in the winter when the sheep are being fed hay. The sheep gradually become debilitated, and within 30 to 60 days after symptoms are noticed, they die. Postmortem examination reveals nothing abnormal except the edematous pneumonia, affecting the dependent portions of the lungs. There is an accumulation of fluid in the pleural cavity. The upper portion of the lungs is usually not affected.

### General Discussion.

From the above brief references to the diseases which occur in sheep in Montana, it will be seen that, so far as is recognized at the present time, the number of sheep diseases which are of real economic importance is small, and in a region where live stock is handled on a large scale, as in the western range country, those sheep diseases which cause very considerable losses are the only ones brought to the attention of the veterinarian. There are, no doubt, other infectious diseases occurring of which cognizance should be taken, and as time goes on and more interest is taken in the study of sheep diseases, we will find that losses to which we have been able to assign no definite cause, will be classified under some specific disease. For instance, during the past winter, we have had considerable loss in some bands from abortions and lambs born dead, and it may develop that an infectious abortion exists. However, bacteriological examination has not thus far revealed any specific infection causing these abortions, and the history leads us to believe that conditions incident to the unusually hard winter and unusual feeding conditions have been responsible for these losses.

### Prevention More Important Than Treatment

In regard to control of disease among sheep in the West, the main efforts of the veterinarian must be along lines of prevention rather than treatment, as is true to an increasing extent in all work with live stock. In this connection, I wish to emphasize the importance of a practical understanding of the habits of the animal and of the methods employed by the sheep man. These remarks apply particularly to the range sheep business as compared with either the feed-lot or the farm. In the first place, it is my experience that the treatment of a sick sheep, even under favorable conditions, is a discouraging proposition. They do not respond to systemic treatment as well as other animals and they seem to "quit" very quickly. But with a practical knowledge of the handling of sheep and of the diseases to which they may be exposed, the veterinarian can do a great deal in the prevention of losses.



Baker's Sheep Diseases.

Scabby buck with entire hindquarters and flank affected. The discolored area is due to dip stain from hand-dressing. —U. S. Dept. Agri. Bul. 713.

These measures include dipping at the proper time for scab and ticks; early recognition and treatment of lip-and-leg ulceration; proper handling during the grazing season to avoid over-grazing a range; avoiding so far as possible areas where poisonous plants exist, or grazing these areas during the season when they are the least dangerous; care to accustom sheep gradually to a strange range, especially where there is marked difference in the forage, as in moving from a "short grass" country to meadow land; avoiding too close herding, which destroys the range, and creates the most favorable conditions for the transmission of infections and parasites; and the control of dogs to reduce the internal parasites. The fact that herders are always with sheep makes it possible to control their movements, and to make a complete clean up in case of dipping or quarantine for any purpose.

While sheep and sheep-herders have in the past held a low position in the estimation of the cow man and people in general, nevertheless the wool-growing industry is of such immense magnitude, and the individual sheep today is so well bred, and of such value, that the veterinary profession in the West should devote a great deal of attention to the study of the sheep industry and the control of sheep diseases.

# Important Diseases of Animals and Their Effect On Human Health

By W. F. LYNCH, Augusta, Maine
State Live Stock Commissioner

TO keep the reading of this paper within the time allotted I shall confine it to the three diseases of animals which are most important: anthrax, glanders, tuberculosis.

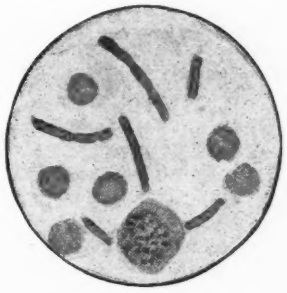
Anthrax was reported as non-existent in Maine in recent reports from the office of which I am the present incumbent, yet, I was not in the office a week before it was reported to me from the northern part of the state in an old abandoned tannery where it must have existed for years, directly menacing the health of the community.

I visited this place, ordered it cleaned up and treated the remainder of the cattle with vaccine. I shall visit it again and have these cattle treated before they are turned out to pasture. The history of this place is that four years ago five cattle died there and were buried in a grazing pasture from which hay was cut every year. This present outbreak resulted in the death of three of the herd; but those treated are recovering. This plague spot will be cleaned up.

### Anthrax Bacillus Discovered in 1850

Anthrax has been known for upwards of three hundred years. It occurred first in cattle and then spread to the human family. Its specific cause, anthrax bacillus, the largest of all germs, was discovered in 1850 by Davaine and from this has grown our accumulating information upon the subject.

This bacillus is a rod-like body with power of indefinite multiplication, causing



Bacillus anthracis.

death by increasing in numbers and producing substances which poison both the blood and tissues of the body. Outside the body the spores multiply in different ways. When conditions are unfavorable to growth, oval bodies (spores) appear within the rods and these are capable of germination after years of drying. They possess much resistance to the effects of heat so that boiling water is necessary to destroy them. They resist the action of disinfectants to a considerable degree.

Carcasses of animals dying of anthrax

should be buried deeply and covered with quicklime before the ground is filled in, and even then the field where such an animal is buried is unsafe from the fact the bacilli thrive on certain conditions of soil, notably those subject to inundation. Elevation does not hinder for it is found in the Swiss Alps at elevations of three thousand feet above sea level. The B. anthracis is a very persistent organism and is difficult to control.

### Two Types of Attack

There are two types of attack in anthrax. In the first stage the temperature rises high, perhaps to 106°, and heart sounds may be heard at a distance from the animal. Tremors and grinding of teeth are noted. The afflicted one may have been trying to keep about with the herd, but it now lies down and the temperature becomes subnormal. These changes are very rapid and an animal which appeared to be in good health one day may be dead the following morning.

The second type of anthrax is more common in cattle. Pain is manifested by kicking and pawing; there are bloody discharges from nose, mouth and rectum, and death results in one or two days. Cattle and sheep are very susceptible to anthrax and none of the domestic animals are exempt. It may be transmitted to man from handling carcasses and hides of animals which have succumbed to disease. It is usually through some abrasion of the skin that the spores gain entrance. This point of inoculation first appears as a dark patch changing into a reddened pimple which later causes a sensation of burning heat. This factor is largely responsible for its name, anthrax (a coal) or carbon (black). Sometimes the site of infection is the lungs, the spores being inhaled by workmen where wool, hides and rags are worked over. This is known as woolsorter's disease.

Sometimes it is communicated to the digestive tract from eating insufficiently cooked portions of meat from animals which have had the disease.

In studies of various infectious maladies, particularly of anthrax, it is found that the most desirable means of preventing their extension is to furnish the susceptible and exposed animals with artificial immunity. Hence the successful vaccination of cattle must consist in stimulating in the animal the production of antibodies that will fortify the body tissues in such a way that no germs can find nurture therein. In this case the animal is fully protected and goes safely into localities that would have been deadly before the vaccination was performed.

The vaccine used in immunizing from anthrax has dangerous properties since it contains living anthrax organisms; hence, it should never be used except where anthrax has definitely appeared and only by qualified veterinarians, as careless handling may result in the extension of the very disease it is desired to eradicate. Vaccines and serums should be obtained from reliable manufacturers.

### Glanders and Farcy Closely Related

Glanders and farcy are closely related, being caused by the same germ, the Bacillus mallei. They differ in that the former name is applied to the disease when the lesions predominate in the internal organs, especially in the nostrils and lungs. When

Marked case of farcy or cutaneous glanders.

Heart with tuberculous proliferations on the outer surface.

it is manifested by lesions on the skin it is called farcy.

Glanders is a contagious disease primarily of the horse, mule and ass, and is communicable to man, the dog, cat, rabbit and guinea pig. Cattle seem to be immune to it and it is with difficulty transmitted to sheep and goats.

It is characterized by the formation of neoplasms or nodules of connective tissue which degenerate into ulcers from which exudes a discharge accompanied by complications of the lymphatic glands, lungs, testicles, internal organs and the subcutaneous connective tissue. Its history is one of the oldest in the annals of medicine, probably antedating any other. Fortunately it is somewhat rare, and efforts to stamp it out are unceasing.

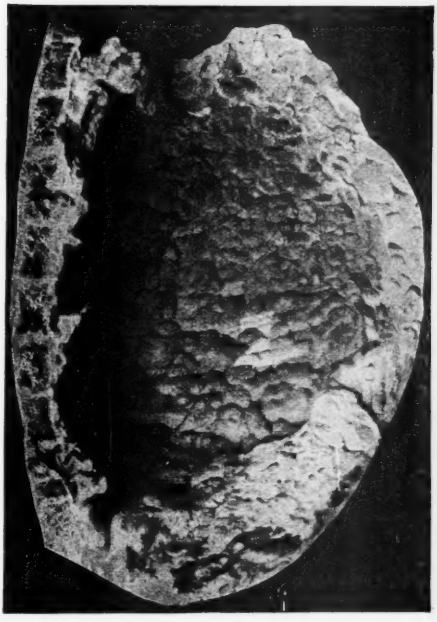
The contagiousness of glanders is today definitely recognized, and the laws of Maine provide for the examination of horses entering the state; this makes it difficult for horses even in which this disease is latent to get in, because of the delicacy of the mallein test to which all imported horses must be subjected.

Glanders is not successfully treated. In most countries the law is stringent in the requirements for prompt declaration on the part of the owner and the veterinarian who diagnoses it. Indemnity is usually allowed for it. In all these cases the animal is destroyed, the place is thoroughly disinfected and its late abode freed of danger to the occupant.

### Tuberculosis

Careful estimates a few years ago showed that two-thirds of the dairy herds in the United States contained tuberculous animals. The losses from this fell scourge total fifty millions of dollars every year. It is hardly necessary to point out that a herd ravaged by tuberculosis cannot be made profitable unless the owner has a reliable method for picking out animals afflicted with this malady. It is authoritatively stated that twelve per cent of the deaths in man from tuberculosis are caused by organisms communicated by infected cows, most of these cases being in young children.

It is capable of demonstration that milk,



Right half of thorax of beef with tuberculosis of the pleura.

butter and imperfectly cooked meat obtained from infected herds may cause tuberculosis in the individuals who eat them.

Tuberculosis may be introduced into a healthy herd in a number of ways, one of these being the purchase of a bull or other animal infected but apparently healthy at the time of purchase. Therefore great care must be exercised in making additions to a herd and all of the incoming cattle should be tested with tuberculin.

# Tuberculin Its Reaction and Use

By CHARLES W. GATES, D. V. M., Demopolis, Alabama

OF the many different diseases which come under the observation of the general practitioner, perhaps none has a greater significance for the practitioner of veterinary medicine in its relation to public health than that much-dreaded disease, tuberculosis.

This condition which has been recognized for many years, has been steadily on the increase, both among the domestic animals and in the human race, and now as a result of a long drawn out series of experiments and research by our foremost scientific investigators, we have been provided with a highly accurate means of diagnosing tuberculosis in cattle. And while the distribution of this deadly infection is nation wide, and we have been provided with a highly accurate substance for the detection of tuberculosis, the fact remains, that the average practitioner fails to take advantage of, and make a rational application of the tuberculin test.

The study of tuberculin dates back to August, 1890, when Robert Koch went before the International Congress at Berlin, and in his address announced that he had discovered a substance, which when experimented with on animals conferred immunity from inoculation with the tubercle bacillus. He also claimed that this substance when injected into the animal tissue arrested tuberculosis.

Many of the profession both in veterinary and human medicine can well remember the wonderful discovery and the marked degree of enthusiasm aroused in the medical world by Koch's announcement. Although premature, the brilliant scientific work together with the sterling character of Robert Koch, and the keen searching interest shown by him engaged the interest and attention of the entire profession to the point where they believed this to be one of the most remarkable discoveries of modern ages, and that the therapeutic value of this discovery would be even more far-reaching than the modest claims of the author.

When Jenners, after a series of observations and experiments, advocated universal vaccination as a true means of controlling and eradicating that much-dreaded disease smallpox, he found that both the profession and the public were very slow to accept his views. And to this day there are some who are either so narrow in their views or so contrary with themselves that they still retain a questionable feeling toward this world-renowned benefactor.

When Harvey after his searching study announced that he had traced the circulation of the blood through the body, he found few even in the older classes, who would entertain and accept his teachings.

### Tuberculosis Still Unconquered

The discovery by Robert Koch was treated quite differently, and given a warm reception by scientific medical men throughout the entire world. They offered no opposition to his statements, but were willing to accept them, and quite anxious to test the efficiency of this new therapeutic agent. And now that the hope entertained by Koch, and in fact the entire civilized world remains unfulfilled, is indeed a sad disappointment shared alike by all, for it can well be said that tuberculosis annually carries away a greater number of our population than any other disease.

The disease in its progress among the food-producing animals has in many instances proved disastrous, and especially to the breeders of pure-bred cattle, since the disease may be present in a herd and remain obscure for a considerable length of

time by failure of the tuberculous animal to show any marked evidence of disease.

In taking up the reaction and use of tuberculin, let us briefly review the observations of investigators of great renown.

Theobald Smith in his experiments with human and bovine culture filtrates found that human broth cultures have an increased acidity, while the bovine becomes more alkaline. The significance of this has not been made clear, although Dorset found that human bacilli contain a high percentage of free fatty acids, and is suggestive since the presence of glycerin was found to bear some relation to the production of acid reaction.

Smith's observations were confirmed by Bang who found that the avian bacilli behave like the bovine in producing an increased alkaline reaction.

### Hoffman's Discovery

Hoffman discovered a mucin-like substance which was later examined by Ruppel and Levene who found it to be nucleoproteid, and further found upon the analysis of the decomposition product of this important ingredient that it contained the essential poison, a nucleic acid present in the body of the bacillus and its soluble secretion.

This nucleic acid set free by decomposition of the nucleoproteids contains about 10 per cent of phosphorus, and precipitated by alcohol it forms the most toxic substance yet found in tubercle bacilli. The toxins dissolved out of the bacilli in broth cultures are identical with those grown on synthetic media, although the three forms of nucleoproteids discovered by Levene differ in solubility, heat coagulation and phosphorous content.

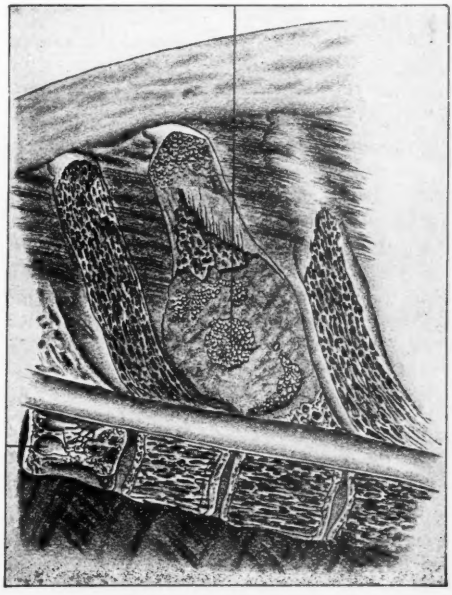
Several base elements of nucleic acid have been discovered by various chemists and interesting actions claimed for the decomposition products, yet their claims have not been supported by clinical evidence.

Tuberculin was the term applied by Koch to the filtered and concentrated broth in which full grown cultures had been boiled, and contained a glycerin broth extract of the bacilli together with such soluble products of the bacilli as were formed during their growth and not precipitated or destroyed by heat.

Since the day of Koch and his original product,, "old tuberculin," there have been various modifications, and they merit discussion with reference to their nature and mode of preparation. All these modifications when viewed from a chemical standpoint contain that peculiar nuclein substance or its derivatives in greater or lesser quantities and degrees of solubility. The endotoxin in some has been altered and decomposed by heat or extractives, yet is still capable of producing the characteristic reaction in tubercular subject.

### The Reactive Phenomena

The explanation of the reactive phenomena has been a mooted question and several contradictory theories advanced. The most satisfactory theory, however, which accords with the modern studies of immunity is in essence that that was first prepared by Ebern Babes, and modified by Smith, where the reaction assumes an enzyme activity in the cells immediately surrounding the bacilli and their products under ordinary conditions. A slow disintegration and digestion takes place but by the added stimulus of tuberculin injections the process is stimulated in the foci if sufficient irritation has been produced, solu-



Vertebral tuberculosis in the hog.

ble or partly digested products of the bacilli are freed which is sufficient to cause local and general reactions.

Von Behring, in his explanation of reactive phenomena, held that precipitation or coagulation of the toxins occurs in the small arteries or capillaries nearest the tubercle.

It is not to be assumed that this alone or invariably is the cause of the congestion but the antibodies are presumably set free to the greatest extent by the cells most under the influence of the toxins. Whether the function of these cells be twofold precipitative, fermentative or not, both phenomena seem to play some part in the reaction.

Repeated injections in increasing doses gradually create a tolerance which is explained in two ways: By the neutralization of the tuberculin by antibodies before it reaches the tubercle (probably precipitins) or the exhaustion of the toxin's access to the reacting cells. Consequently this tolerance is not lasting and the reaction power may return after cessation of the injections, so long as the cells remain which retain sensitiveness.

I think sufficient has been given to show that the reaction is the result of an affinity existing between the tuberculin and the products of the tissues stimulated by tubercle bacilli. It is only natural to suppose that when the two are brought together in the same animal tissue a reaction would take place.

### Reaction Fails Under Unfavorable Conditions

It is important, however, to understand that under certain unfavorable conditions a reaction will not take place following the injection of tuberculin. And here is one of the pitfalls in applying the tuberculin test, and to my mind if we are to fully establish and measure the diagnostic value of tuberculin as a means of detecting tuberculosis, it will require the most scientific and searching consideration of the one applying the test. And so long as we cling to the thought that the tuberculin test is a mechanical procedure, just so long will we be groping in the dark so far as accuracy is concerned.

The following conditions I believe are often the cause of sad disappointment in applying the test:

Where the tuberculin has not been properly prepared.

Where the post injection temperatures do not extend over the required length of time to detect the late reactions.

When infected animals are tested during the period of incubation before lesions have developed.

When the lesions are arrested, encapsulated, healed or when the lesions are very extensive.

Animals should be considered as unfit to receive the injection of tuberculin when in advanced pregnancy, or when passing through the period of estrum.

Animals suffering from any acute infectious disease should be considered unfavorable subjects. One thing I believe that is worthy of our serious consideration and a factor that has been a common source of error in the application of the tuberculin test is in the amount of tuberculin injected. In many cases no doubt where the injection of tuberculin has failed to produce a reaction in tuberculous animals the failure has been due to the fact that a sufficient quantity was not injected to stimulate cellular activity.

It is very necessary in applying the tuberculin test to place animals to be tested in a comfortable place under normal surroundings, and allow them to remain quiet, especially about the time the reaction should take place, for some individuals under sufficient excitement will show a decided rise in temperature.

A vital factor to the test and one we should not fail to bear in mind is the clinical evidence of advanced tuberculosis, for it is only reasonable to feel that in such cases we might expect to find lesions broken down and extensive, setting free enormous quantities of toxins, and the usual amount injected fails to cause the reaction.

In these cases in my work I have given as much as ten times the dose prescribed, and to my knowledge have never been disappointed in the results obtained.

### Accuracy Essential in Using Tuberculin Test

In conclusion may I say that a reasonable amount of good judgment is necessary on the part of the one in charge of the test, since failure on his part to take into

*(Continued on page 386)*

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# Columbus Meeting of the A. V. M. A.

AS our readers know, the fifty-seventh annual meeting of the American Veterinary Medical Association will be held in Columbus, Ohio, August 23rd to 27th inclusive. The headquarters of the meeting will be at the Deshler Hotel, and the sessions will be held in the new Columbus Memorial Hall.

The program for the meeting is not yet at a point where definite announcements can be made, but the officers of the association admit it will be good, and nobody doubts it.

Annual meetings of the A. V. M. A. are becoming increasingly attractive to veterinarians for reasons other than the program rendered. It is possible to stay at home and read the papers presented and a complete report of the discussions, and perhaps get more out of this part of the meeting, than can be had from attendance without subsequent reading. But nothing can make up for other features of the meeting that are to be enjoyed only by those who attend it. The opportunity for renewing old acquaintances, and for making new acquaintances; the opportunity for visiting and for discussing matters of importance with individuals and groups must outweigh considerations for staying at home, where such are not absolutely imperative; and since the advantages of these features are proportionate to the attendance, the Columbus meeting will undoubtedly excel all preceding meetings in attractiveness.

The local committee is planning upon an attendance of 2,000 members and 1,000 visitors. Its estimate is too high, but even if the number attending attains half the estimate, it will far exceed the attendance of any previous meeting, and there seems every prospect that it will at least exceed half of the committee's estimate.

The local committee on arrangements for this meeting was organized early and at once began active preparations for the meeting, under the skillful direction of Dr. F. A. Lambert, of Columbus, chairman. The committee had the situation in hand months ago to a degree that would have enabled it to handle the meeting on a week's notice, smoothly, efficiently, in a manner to suit the convenience and enhance the pleasure of those attending. That it will be fully ready when the time for the convention arrives cannot be doubted.

Badges, ribbons, prizes, souvenirs, sightseeing trips, picnics, receptions, music and dancing have already been arranged, but much of this must be withheld for the pleasure of anticipation. However, the following may be mentioned as leading features.

RECEPTION BY OHIO VETERINARIANS. There will be a reception by the Ohio veterinarians on Monday, August 23, 8:00 p. m. This reception will be held in the ballroom of the Deshler Hotel, a room that is automatically cooled and should be comfortable even in August. The reception will be followed by dancing. The function will be informal.

OHIO CLOVER PARTY. This will be held in the ballroom of the Deshler Hotel, August 24, 3:00 p. m. The entertainment

will include music, readings, special dances, refreshments and adequate rewards for the few ladies who are fortunate enough to receive four-leaf clover favors. The great majority who will receive three-leaf clover favors will needs be content with having a good time.

SPECIAL SHOW FOR THE LADIES. Southern Theatre, Wednesday, August 25, 11:00 a. m. Admission will be by complimentary ticket. The show will include moving pictures and music by a sixty-piece orchestra.

PAGEANT AT THE COLISEUM. Wednesday, August 25, 7:30 p. m. Admission by complimentary ticket. This pageant will be held at the State Fair Grounds and will be participated in by 1,000 persons, of whom 600 will be children. The pageant is the finest of its kind put on anywhere in the world. The costumes alone cost $4,000. The duration of the pageant is one hour and ten minutes. It will be a regular feature at the Ohio State Fair the week following the meeting of the A. V. M. A. Sufficient additional features have been engaged to give the visitors a two-hour program.

PICNIC AT THE SPRING. This will be held Thursday, August 26, at noon, and will be complimentary to the ladies only. The spring is located on the campus of the Ohio State University.

ANNUAL BANQUET. Thursday, August 26, 7:00 p. m. This will be held in the ballroom of the Deshler Hotel. There will be no toasts and no speeches, but plenty to eat and as good a cabaret as can be secured anywhere. Attendance limited to 800.

ALUMNI MEETINGS. Arrangements will be made for meetings of the Alumni of all the veterinary colleges.

HONORARY RECEPTION COMMITTEE. Visitors at the meeting will be given a hearty welcome. That none may be overlooked, the following veterinarians, long prominent in Ohio, have been appointed as a special honorary reception committee and notified to report for duty Sunday, August 22, and

THE OLD SPRING

*"Lean above my crystal brim,*
*Give your heart to memories dim.*
*Drink, and in my mirror see*
*The face of him you used to be."*

to remain on duty throughout the meeting: Drs. A. S. Cooley; E. H. Shephard; J. C. Meyer, Jr.; J. V. Newton; J. H. Blattenberg; L. A. Merillat; Septimus Sisson; W. H. Gribble; J. D. Fair; L. P. Cook; S. D. Meyers; Harry Fulstow; W. E. Wight; C. B. Frederick; Walter Shaw and Paul Fischer.

# Anti-Hog Cholera Serum Supplied at Cost; Used On A Professional Basis

LAST month we discussed at length the proposition before the Illinois and Iowa veterinary associations to institute a plan for charging for vaccination for the prevention of hog cholera that would protect the honest veterinarian who was doing this work at a reasonable price, from the imputation of wrong doing by those of a suspicious turn of mind, and those interested in stirring up trouble or causing friction, and which might at the same time render it possible to more readily detect overcharging in those rare cases that supply the only basis, in fact, for the aspersions that certain agricultural publications and a few misguided county agents have cast somewhat generally upon those engaged in the work of hog cholera control.

Without repeating in detail what was said last month, we may say briefly that conferences were held both in Illinois and in Iowa between representatives of the state veterinary associations and the state agricultural associations of these states and plans for charging for hog vaccination formulated to be submitted to these bodies. Since the article referred to in the foregoing was published, meetings of both the Iowa and the Illinois veterinary associations have been held and this matter has received the most careful consideration.

In both states the veterinarians were in hearty accord with the objects of the plans submitted by the conference committees, but there was no little difference of opinion as to the best means by which to accomplish those objects. In both meetings the plans were somewhat amended, so that it is necessary for them to go back to the agricultural associations for approval before becoming effective. It was the wish of the Iowa association that details of its plan for co-operating with the state agricultural association be not discussed publicly until the agricultural association had acted upon it. However, it may be said, without violating any confidence, that the meeting was well attended, good feeling prevailed throughout and the association looked upon the whole matter as a business proposition and took steps accordingly. It was agreed that a twenty-five per cent margin as a handling cost for serum was reasonable, and that it was impractical to establish a uniform charge for the administration of serum and virus, though there were many expressions that in the ordinary case, a charge of $1.00 a mile for the distance traveled one way, and 15c per hog for the vaccination, was reasonable. Still, it was fully realized that each case is an individual one and must receive individual consideration and such charges might not be applicable in no inconsiderable part of the work.

In Illinois, the opinion of the association as to how the subject of anti-hog cholera vaccination should be handled in the future by its members and others engaged in this work is embodied in the two resolutions that follow, both of which were unanimously adopted by the association and now go to the state agricultural association for consideration.

### Report of Committee on Hog Cholera Vaccination

We, your new committee on hog vaccination, have given careful consideration to all the propositions submitted by your former committee on this subject, and find its report in some respects unsatisfactory. We beg to submit the following substitute report and recommend its adoption by the association, and submission to the Illinois Agricultural Association.

1st. It is recognized that the professional skill and services of veterinarians in the treatment of hogs for the prevention of cholera and the actual time employed in immunizing different herds vary to such an extent as to render a uniform charge impracticable. The Illinois State Veterinary Medical Association agrees that such charges shall be conservative and reasonable and in keeping with the services rendered and the professional skill required.

2nd. The veterinarian shall, when requested,

state the particular kind and brand of serum and virus used and the serial and license number of each and their net cost to him. This statement may be rendered on a uniform blank agreed upon by a joint committee of the Illinois State Veterinary Medical Association and the Illinois Agricultural Association.

3rd. To promote better feeling among stockmen and to stimulate better veterinary service in the state, this association recommends that a joint committee of six be appointed to consist of three active veterinary practitioners, members of the Illinois State Veterinary Medical Association and three members of the Illinois Agricultural Association, whose function it shall be to consider suggestions, questions and complaints referred to it from time to time by individuals or by either association.

**Resolution Concerning the Penalty for Violating the Usages of Professional Conduct**

For the protection of the personal interests of the live stock producer against unprofessional conduct on the part of any member of the veterinary profession licensed to practice within the state of Illinois, and to promote the interests of the veterinary profession and to secure better veterinary service in the state.

BE IT RESOLVED, 1st, That the Illinois State Veterinary Medical Association endeavor to secure the enactment of a law providing for the revocation of the license to practice in this state of any veterinarian found guilty of unprofessional conduct, or of making exorbitant charges for his services, and that it ask the aid of the Illinois Agricultural Association in this endeavor.

2nd, That all charges of unprofessional conduct on the part of any member of the veterinary profession shall be filed with a special committee of the Illinois State Veterinary Medical Association, said committee shall investigate all such charges and report the result of their investigation to the association, which shall take such action as the circumstances demand.

3rd. In order to prove effective, the law should provide that properly constituted state officials shall revoke the license of any veterinarian found guilty of unprofessional conduct. Evidence of guilt shall be deemed sufficient on the affirmative report of the committee authorized to conduct official hearings approved by a majority vote of the members of the Illinois State Veterinary Medical Association in regular session.

## Plan Meets General Approval

It was believed by the Illinois veterinarians that the foregoing would be more workable than the plan supported by the conference committee. In fact, it seemed to be the opinion of the overwhelming majority of those largely engaged in the vaccination of hogs and therefore familiar with all practical aspects of the matter, that the plan of the conference committee was impracticable.

It was pointed out that the basis upon which vaccination charges were made vary so widely in different localities, and in the practice of different veterinarians, that any attempt at uniformity, unless based upon the most general lines, would result in changes little short of revolutionary and cause endless confusion, and could scarcely be less unsatisfactory to the swine owner than it would be awkward for veterinarians.

To cite a single instance: Some veterinarians virtually look after the interests of their clients in the matter of swine practice from the farrowing pen to shipment for slaughter, and charge only for the vaccination, making no charge for such inspection as may be needed prior to vaccination, or any autopsies that may be held, or for any trips to the herd after it is vaccinated; charging for this whole service, say 2c per c.c. for the serum and virus administered.

Manifestly such a charge may be a most reasonable one and yet the veterinarian might be subject to criticism by those who do not know all the facts, or who do not care to consider all of the facts. It gives one wishing to stir up dissatisfaction in a farm bureau, for example, an opportunity to get from the swine owner a statement of the amount of serum used, the number of hogs vaccinated, and the time required for the work and the veterinarian's bill. Then by figuring the cost of serum at the lowest price at which it is possible to obtain any serum anywhere, he is able to make out a pretty strong case, and just this thing has been done over and over. A plan by which such misrepresentation can be avoided, or a plan that will make such misrepresentation more difficult, should inspire confidence in the minds of swine owners and promote good feeling between the farm bureaus and the veterinarians that will materially benefit both.

Let us carry the foregoing illustration a little further: It is only necessary for the disturber to find a veterinarian who makes a charge for calls when no vaccination is done, who makes a charge for autopsies and for visits following vaccination and therefore can afford to, and does make a smaller charge for the actual vaccinating, and to get one of this veterinarian's bills for vaccinating a herd of a size similar to

the one mentioned above, and he will come pretty near convincing the ordinary farmer that the first veterinarian is overcharging for his work.

### Problem A Very Real One

To many veterinarians a question will arise as to the necessity for all this discussion. They should be reminded that in certain localities, in certain counties, and even in one or two states, this problem of unrest in the matter of vaccination charges has become a very real one, one that will extend; and that if the veterinarians of the swine-producing section of the country are to retain the confidence of their clients they must realize that there are disturbers in their community, that inequalities are being dragged up and paraded before the swine-owning public; that veterinarians, few though they be, who have overcharged for this work, have been held up as examples of what the swine-raisers have to put up with; that it is a condition and not a theory that now confronts part of the veterinary profession and gives promise of confronting all of it soon if it is not solved and solved in the right way and, finally, that it can be solved only by meeting it fully and fairly and making such adjustments as the changed conditions may necessitate.

The varying and uncertain price of serum has had something to do with bringing about this unrest, and has perhaps been responsible for more variation in the price of vaccination of hogs than any other one factor. With the plan proposed in both Iowa and Illinois, this one cause for dissatisfaction will wholly disappear, since by this plan any swine owner may know, just whose serum is used on his herd and what it cost. And, thus in the matter of charges, the veterinarian who uses high-priced serum will not be at a disadvantage with the one who uses serum that costs him less. The swine-owner may decide for himself, or on the advice of his veterinarian, what serum he wishes to use; and the fee for the work will remain, as, being a professional charge, it should remain, with the veterinarian.

### Owner Vaccination Detrimental to Swine Industry

Owner vaccination of hogs is a question that constantly comes up, now in one place, now in another. It is not a good thing for the swine industry. It is not a good thing for the veterinarian. A means that will discourage it should be welcomed by veterinarians and by thoughtful swine-raisers. We believe that nothing else will discourage it so much as the growth and maintenance of good feeling between the swine-raiser and the veterinarian.

Contrary to the belief of some, the serum companies do not welcome farmer vaccination of hogs. The fact is the conscientious serum producer views with no little foreboding of trouble the use of his product by laymen and figuratively trembles in his shoes whenever his serum and virus are injected into a herd by a layman.

A letter from Prof. Kennedy, quoted elsewhere in this issue, is typical of this attitude. Mr. Shinn, to whom this letter was addressed, is the farm adviser of Fulton County, Illinois, and the foremost proponent in the state of farmer vaccination. Perhaps with a single exception, he is the only proponent of farmer vaccination among the eighty-four farm advisers in the state. That he is riding for a fall, no veterinarian familiar with the conditions in Fulton County doubts; but in the meantime veterinary practice in that county will be hurt and the swine industry will be injured far more. These injuries will continue after Mr. Shinn and his farmer vaccination are forgotten, except by those who lose by it.

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## WILL THE INTERSTATE TRADE IN TUBERCULOUS COWS BE RESUMED?

Our readers will recall with satisfaction the announcement of the conviction of James Dorsey, the notorious dealer in tuberculous cattle and his sentence to eight years' imprisonment in the Federal Penitentiary at Leavenworth, Kansas. After almost interminable appeals and delays, he actually began to serve his sentence something more than a year ago.

Now comes the announcement that his sentence has been reduced by executive clemency to four years. Upon hearing this, Judge Kenesaw Mountain Landis of the Federal bench in Chicago, and in whose court Dorsey was tried and by whom he was sentenced, commented as follows:

"This man Dorsey was indicted after he had sold an average of 12,000 cattle a

year, making a profit of about $10 a head.

"He represented himself as a breeder of pure-bred Holstein cattle, and guaranteed that every animal in his herd was tuberculin tested. Then he picked up all the sick cattle he could buy at cheap prices, doctored them up and sold them for healthy animals. He hired a veterinarian at about $75 a month to sign blank certificates, and flooded the country with cattle afflicted with tuberculosis.

"Finally he was tried for using the mails to defraud and sentenced for eight years. By some oversight, I suppose, he finally was sent to the penitentiary.

"I suppose Dorsey is due for a pardon now, but I wonder what frame of mind a man must be in to pardon a criminal like Dorsey."

"I don't see much use of staying on the bench," said the Judge who fined the Standard Oil Company $29,240,000.

## NEW COURSE IN MEAT AND FOOD INSPECTION

Announcement has been made of a change, consisting of a considerable extension in the course of meat inspection maintained in Chicago for veterinary officers of the army.

The new course for those taking instruction in meat and food inspection is very comprehensive. It comprises eleven weeks of 41½ hours each, a total of 456½ hours. There are four periods each day, which consist of seven and one-half hours, except for Saturday, when instruction is given only in the forenoon.

Instruction is given on the following subjects: Organization of a meat inspection and dairy hygiene service; Supply circulars and bulletins; Practical and theoretical work on reinspection; Sanitation; Antemortem and post-mortem inspection; Inspection of fish and other sea foods; Inspection of butter, cheese, oleomargarine and rendered oils; Inspection of dairy farms and forage.

The school will be a permanent institution and will operate continuously. In addition to giving instructions in these subjects to all permanent veterinary officers in the army, new officers will be sent here for instruction as a part of their preliminary course when they are commissioned.

All of the second lieutenants in the regular army have now taken this course, and instruction of the officers holding higher ranks has commenced. Majors Vans Agnew, Seeley and Donovan have recently taken the course. It is planned to keep the classes small, probably to include not more than five officers.

Captain H. S. Eakins has been detailed to assist Major G. A. Lytle, who is in charge of all veterinary activities at the Chicago Quartermaster Depot.

## MAJOR GENERAL WILLIAM C. GORGAS

The death on July 4, 1920, London, Eng., of Major General William C. Gorgas, marks the passing of a great soul and one of the world's greatest men; gaged by the greatest tests, service to mankind, he outranks kings and potentates.

Known and recognized as the world's foremost authority on military medicine and surgery, he is a type of the twentieth century hero, a conqueror of disease, a servant of humanity.

His work in fighting and conquering the malarial mosquito in Panama, making possible the construction of that great waterway, his routing of yellow fever from its century-old stronghold in Havana, and again in Central America, Peru and Ecuador and other countries, brought him high honors in the medical profession, both at home and abroad, and his services and counsel on sanitation have been in demand throughout the world. He was decorated by the French government, knighted by King George of England and a degree conferred upon him by the University of Oxford. Notwithstanding all this attention, he remained plain, unassuming and humble as to his achievements.

General Gorgas reached the age limit in the service of the U. S. A., while on duty in France, and was retired from active duty at the close of the war. Born in Mobile, Ala., in 1854, he died at the age of 66, a comparatively young man—old beyond measure, if estimated by his service to his fellow men. Beneath his name in the Hall of Fame belong these words: "If any man would be greatest among you, let him be the servant of all."

General Gorgas was a steadfast friend of the veterinary corps of the army. During the half century, more or less, that the

veterinary corps was in the hands of the quartermaster department of the army, it never received the recognition due the humblest profession. Veterinarians were neither enlisted men nor commissioned officers, nor had they the authority necessary to perform their important duties efficiently or effectively.

In the four years that the veterinary corps has been a part of the medical department of the army, recognition has been accorded it and grades authorized from second lieutenant to colonel, inclusive, and an enlisted personnel has been provided. In short, as a scientific branch in a scientific department of the army, the progress it has made has been immeasurably greater in four years than in forty years in the quartermaster department, and to the recognition and untiring efforts of General Gorgas, no small amount of this gratifying condition is due.

## METHODS OF CHOICE IN IMMUNITY

To throw light on the comparative values of the various methods of vaccine therapy commonly employed, a detailed study is reported of a number of cases of streptococcal infection treated in different ways. Existing methods of immunizing against the streptococcus are summarized as follows: A, with a serum alone; B, with a serum, followed after a short interval by a full dose of vaccine; C, by a serum in the acute stages, followed by a vaccine when the subacute stage has been reached; D, with vaccine alone; and E, by immunization in vitro as recommended by Wright (E. S. R., 41, p. 187).

Of the cases recorded, 10 were treated by method A, 3 by B, 4 by C, 3 by D, and none by E. The principle followed was to avoid vaccines unless antiserum was also present or, to follow the author's axiom, "against an exotoxin a serum should be employed, against an endotoxin a vaccine, and against a combination of both exo- and endo-toxin both a serum and a vaccine should be used."

Out of the 20 cases reported there were 14 unequivocal successes, including 2 cases of well-defined septicemia. The results obtained indicated that to get the best results method B should be followed, although in very toxic cases method A (serum alone) should be the choice. Vaccine alone was found to be without value in wound infections in which sequestra and foreign bodies were present. Attention is called to the danger of anaphylaxis in cases which have previously had serum. In such cases a small dose of the serum followed by an interval of several hours for development is recommended.—A. G. SHERA, *Lancet, London, 1919, II, No. 21, pp. 909-914, figs. 12.*

## CAUSE OF ABORTION IN MARES

From an outbreak of abortion in Iowa there was isolated an organism of the paratyphoid-enteritidis group, which in cultural and morphologic characters and in serologic reactions is apparently the same as the organism studied by Good, Meyer, and others, and variously named by them *B. abortivo-equinus, B. abortus equi,* etc. The dry, brittle, membranous growth on slanted agar which was observed by these investigators was present in the cultures isolated in this outbreak, and this peculiarity is of great value in identification of the organism. With this organism abortion was produced in the rabbit, guinea pig, sow, and mare by intraperitoneal or intravenous injection of minute doses in 2, 6, 2, and 11 days, respectively. Feeding and intravaginal introduction of the organism did not result in abortion in any animals thus treated.—C. MURRAY, *Jour. Infect. Diseases, 1919, XXV, No. 4, pp. 341-348.*

## EFFECT OF CATTLE TICKS ON IMPORTED AND LOCALLY GROWN AYRSHIRE CATTLE

*Piroplasma bigeminum,* the casual organism of Texas fever, has never been definitely identified in the blood of native cattle in Guam, but introduced Ayrshire cattle exhibit symptoms similar to Texas fever whenever they became tick infested. *Boophilus (Margaropus) annulatus australis* and *B. annulatus* are both recorded from the island. Of the original imported stock two individuals died of the disease and the remaining two after several years have apparently acquired complete immunity. With one possible exception the locally-bred pure-blooded progeny of the imported cattle have been entirely immune to the disease.—*Rept. Guam Agric. Expt. Sta.,* 1918, *Washington, D. C.*

# Department of Surgery

By DR. L. A. MERILLAT

## General Analgesia

A RELIABLE system of general analgesia—one that actually controls pain—is very much needed in veterinary practice, because objections to general anesthesia do exist for many of our operations. There is need of an analgesic drug or combination of drugs that will relax the muscles and lower the reflexes sufficiently to enable us to perform all of those operations in which such anesthesia as chloroformization is not actually required. Inhalation anesthesia is a cumbersome adjunct to an operation of short duration. It requires more time both in the preparation of the patient and administration than is called for in many instances. Such highly painful operations as dehorning and castration should by right be done under the influence of some pain-controlling agent, yet we would hardly expect anyone to resort to chloroform in these cases. There is the element of cost, lack of trained anesthetists, the addition of the hazards of anesthesia to those of the surgical traumatism and the difficulties of administration to operate against the use of this measure. These are facts the most ardent champion of general anesthesia in animals can not refute. It is small wonder, therefore, that we continue to search for a more simple substitute, one that will help the surgeon and exhibit some marked degree of analgesia for the patient.

There are operations for which chloroformization or etherization is the only sane procedure; there are others in which effectual general analgesia would be preferable; and there are still others wherein local or regional anesthesia answers as well if not better than the others. In view of these facts, an approved standard would be very helpful to the practitioner as well as a step toward the more general resort to analgesic methods. The standard should of course be a flexible one rather than fixed, since much must always be left to the operator who alone is familiar with all of the conditions that call for changes.

But before teaching these principles let us inquire into the real virtues, the actual merit of the available agents upon which a surgeon can depend for a general analgesic. The agents for anesthesia both local and general have been consecrated by long usage, but the good, reliable general analgesic is still lacking. Most of them merely stupify the patient (and ease the conscience of the operator), but they have little to commend them above the analgesic of the ante-anesthesia days. Scanning the list available we find the surgeon has the choice of chloral administered by different routes, morphine administered hypodermically, H. M. C. (Abbott), Cannabis indica and chloroform and ether per os. There are a few others of lesser importance.

CHLORAL in the writer's hands has always been a disappointment as a surgical analgesic. It is more stupifying than analgesic. When excruciating pain is inflicted (incision of the skin, dividing nerve-trunks, etc.), the tell-tale struggles are not modified; in fact they seem to be abnormally forcible. As regards its influence on the reflexes and musculature, it is no better than the stupifying agents of the old surgeons.

It is, however, useful in animal surgery when restricted to its proper indications. By stupifying the patient it helps the operator to effect a better physical restraint in refractory subjects; it is useful in handling

intractable subjects for non-painful manipulative work, such as clipping, shoeing, explorations, wound dressings, etc.; and as a preliminary anesthetic it is par excellence the best agent we have. Given before chloroform it reduces the struggling stage to the minimum and lessens the danger of over-saturation by reducing the amount required. Beyond these presents chloral may well be discarded in animal surgery. Intraperitoneal and intravenous transfusions and rectal injections require careful preparation and handling of the solution, containers and delivery mechanism without material improvement in the effect over the administration per os, and the whole procedure if done with a view of assuring safety is all more cumbersome than the administration of an inhaled anesthetic.

MORPHINE is a useful surgical analgesic if given in very large doses (Quitman). It excels chloral as a general analgesic. It is less stupifying but lowers the reflexes and relaxes the muscles much better. In short, it is analgesic. A horse receives twelve to fifteen grains hypodermically a few minutes before the operation; dogs and other small animals in proportion. However, it produces an objectionable postoperative delirium that leaves much to be desired in the horse.

CANNABIS INDICA when given per os in sufficient dosage for surgical work produces a lasting delirium without any preliminary analgesic influence of material benefit. Administered intravenously in the form of a fluid extract it produces a prompt stupifying effect but, as with chloral, the patient is no beneficiary—there is no appreciable alleviation of the pain. Besides, the drug in the form available is not a suitable agent to introduce directly into the blood stream.

H. M. C. (Abbott) has given good results in dog and cat practice and retains many admirers, but it is entirely too delirifacient for the horse. It is not analgesic for horses.

CHLOROFORM-ETHER AND MINERAL OIL. Chloroform and ether administered as a drench in mineral oil produces a good but transient analgesia. Its action is, however, lasting enough to meet the needs of many of our operations of short duration. Two ounces of chloroform and two and a half to three ounces of ether in twenty ounces of paraffin oil given on an empty stomach twenty minutes before the operation give an analgesic action without hazard or harmful sequelae in equine operations. This is probably the safest and simplest general analgesic for equine surgery today.—L. A. M.

## POSITION OF VETERINARY SCIENCE*

"The Veterinary Surgeon's Act (1881) Amended Bill was read a third time on June 11th, and it seems quite probable that the bill will become a law. For a time there has been a lack of funds available for the Royal College of Veterinary Surgeons to enable it to carry out its statuary duties and to improve veterinary education. The chief object of the bill is to remedy this situation, and to this end it provides for the compulsory payment of one guinea by all members of the college who are in active practice in the United Kingdom. The bill also gives status to the practitioners who were registered under the Act of 1881. Much controversy has arisen as to the status of veterinary science in this country, and a great many educationalists think that great benefit would accrue to the scientific status of the profession through a provision at all universities for the granting of veterinary degrees. But the practical value of a university degree would depend upon the facilities existing for the imparting of veterinary instruction. It would only be by a slow and gradual process that these facilities could be obtained and then if there were not sufficient demand for university veterinary degrees the innovation would be a barren one. The profession is only a small one and the prizes securable in it are not likely to cause a great rush of intellectuals to seek entry into its ranks. The real advancement of veterinary science can only follow an educational campaign in the whole realm of animal breeding and rearing. It is difficult to get the zeal of the benefits of science into the hearts of workers among animals. Appalling ignorance abounds and sheer laziness increases every day.

"In quite recent times we have heard of such medieval enormities committed as these: Human feces put on to a festering sore to heal it; a red herring tied to a cow's tail with the object of making it rise; and a sliced union put into the vagina of a

*Lancet, London, Vol. CXCVIII, No. 5051, p. 1329.

mare to cure colic. The simple lessons of hygiene in many cases are unknown and, when known, in 60 per cent of cases they are not practiced. . . . . The whole question is one of education, finance and zeal for hygiene. How long will it take to bring these things up to an effective pitch? At present the good food that veterinary science provides is not half assimilated by those for whom it is intended and any culinary refinement will be thrown away and wasted."

### Comment

The above editorial seems worthy of serious thought at this particular moment in America, especially in regard to the following quotations:

1. **"The profession is a small one."** With only one qualified veterinarian to every (about) 6,000 of population it is more essential than ever that we keep so closely organized that a good full-strength front can always be presented. It is, however, more than this just now to the veterinary profession of the United States, because in a republic like ours the handicap of small numbers is a real danger to progress no matter how high our intellectual standard may become; for with us Americans there is no greater indictment than numerical insignificance.

2. **"The prizes securable in it are not likely to cause a great rush of intellectuals to seek entry into its ranks."** Today, this seems to be the crux of an approaching situation due to closing of the private colleges. With this portal closed the burden of alluring recruits from among the intellectuals of the country now rests heavily upon the shoulders of our remaining educationists. They must in some way make the education and practice of veterinary science attractive enough to invite attention from those qualified to enter. Just how this is to be accomplished remains to be worked out, but work it out we must if we would survive as an entity worth while. The esthetic objection to veterinary practice as a vocation cannot be hastily removed, if at all, and it must not under any circumstances be removed by avoiding the unpleasant phases of our work; that is, we must not stand idly aside and willingly allow charlatanism to thrive because certain things we are required to do are not of a high enough order to undertake. But the "prizes securable" may at our will be greatly improved. We must attract recruits by working for better positions for our publicity paid men, veterinary inspectors, investigators, state and assistant state veterinarians, professors and teachers in the veterinary colleges, and we should make an effort to increase the number of these positions as much as possible. Then for the great masses—the practitioners—the state associations should take up seriously the matter of higher fees. We seem to be the one class of men who are working for ante-war prices. Our fees, always too low, are now entirely out of proportion to the actual value of our labor. More public positions and better pay for publicly-paid men and higher fees for veterinary practice will help some, at least, to bring in more men. Then we all should become boosters instead of knockers. We talk too much at random about our trials and tribulations and thus scare away men who might otherwise enter. It is a duty now for all men interested in the advancement of veterinary science to seek to recruit its ranks to full strength, and this cannot be done by bewailing our status, our work and our prospects.

3. **"The good food that veterinary science provides is not half assimilated by those for whom it is intended."** Here is a truth that veterinarians of all classes fully comprehend and one which tends very materially to prevent the full utilization of our usefulness. It is the fault that promotes quackery and keeps down our numerical strength as much as any other thing. Just so long as our capabilities are unassimilated progress will be impeded. Publicity would seem to be the cure for this evil. Educational campaigns among those for whom our "good food is intended" are very essential. We have been too modest, too indifferent, or probably too well satisfied with ourselves to keep up with the profession of human medicine in this particular connection for it is apparent that "medieval enormities" and all manner of freakish superstitions are more commonly practiced among animals than among humans and the "zeal of hygiene" is more common in the house than at the stables.

In our campaigns for existence and advancement these cold facts should be

looked squarely in the face, and the problems they impose must be tackled with a stubborn determination to solve them.—L. A. M.

## THE OLD CRIBBING OPERATION REVISED AND MODIFIED

Vorkink, Trezee and Siebelink in the *Tijdschrift Voor Veeartsenijkunde*, Jan. 1919, describe a modification of the Forsell operation for cribbing that seems well worth a trial. They report ten cures in twelve cases operated upon. Veterinarians of two and three decades ago will remember the cribbing operation performed at clinics and its description in current literature. It was practiced extensively in the 90's but was abandoned gradually as unreliable. In the writer's clinic it was found to give only temporary benefit if any. As performed at that time the operation consisted of a myotomy of the cervical muscles destined to the larynx and hyoid bone. The sternothryo hyoideus and the subscapulo-hyoideus were the muscles divided but in the course of the operation the sterno-maxillaris was usually included. In this mass of musculature is found the main trunk of the spinal accessory nerve if performed at about the junction of the middle and upper thirds of the cervical region. Thus the operation was both a neurotomy and a myotomy.

In the modified operation the seat of division is transferred to the region of the larynx where these muscles on both sides are not only divided but forcibly torn from their attachments in a way to put them permanently out of function. The patient is narcotized with chloral and the seat of operation is anesthetized with novacain and then placed in dorsal recumbency as if for an operation for roaring. An incision is made in the median line of the throat extending from the base of the hyoid bone over the larynx to about the second ring of the trachea. It is carried through the skin and underlying musculature, exposing the hyoid, larynx and trachea. The skin is then separated from the muscles in a downward direction until their upper border is reached. This is indicated by reaching a zone of loose connective tissue. The operator is warned to avoid the external maxillary vein which is closely related to the line of dissection and which is so masked by connective tissues that it lacks the characteristic blueness by which veins are recognized. When the skin has been thus loosened the whole muscular mass is hooked up with the index finger and divided posteriorly. The stump is then grasped and torn forcibly outward and forward. If the resistance is great the tearing is facilitated with the bistoury. At the tendinous insertions it is cut off. Care must be taken to include the thyroid attachment of the sterno-thyro-hyoideus. If this has not been lifted it must be attended to separately. A couple of loosely arranged stitches that will not block drainage complete the work.—L. A. M.

## THE TREATMENT OF QUARTER CRACKS

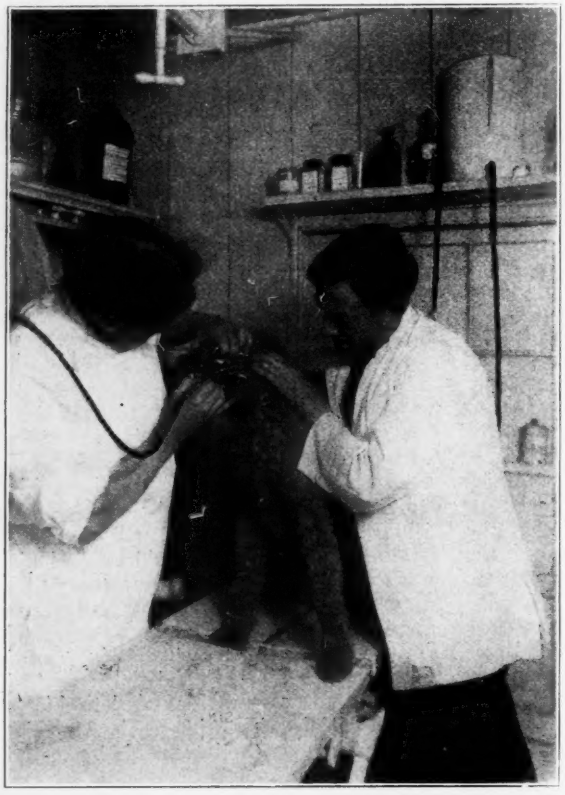
I would like you to give me the technic for treatment of a quarter crack that has extended about half way up to the coronet, from the inferior surface of the hoof on the inside quarter, or if you have a book that treats on it, that is not too expensive, send it to me.—D. H. C., Ohio.

REPLY: Hoof crevices extending in an upward direction from the hoof margin are not usually classified as quarter cracks. The real quarter crack extends from the coronary cushion downward and is due to a lesion in the cushion itself. Such cracks as the one herein described is either traumatic or else due to desiccation of faulty formed horn fibers. When the whole quarter is roughened in character or ridged the condition has often been called false quarter. Such quarters often crack from below upward. The remedy here is to perforate the wall at the proximal end of the crack right down to the insensitive laminæ. A quarter-inch hole made with a brace and bit or with a small hoof knife is required. The hoof should be shod with a shoe that bears evenly along the wall of the quarter. That is, the wall at the quarter must not be pared so as to prevent it from bearing upon the shoe as is so often done to relieve (?) affected quarters. This done, the coronary region may be subjected to a mild blistering with cantharides ointment, about one to sixteen. It is also advisable to keep such hoofs oiled with neats' foot oil.—L. A. M.

## OMPHALO-PHLEBITIS OF COLTS

Under the title of *"Pyosepticemia of New-Born Colts,"* Mr. L. Paniset in the *Revue Generale de Medicine Veterinaire*, March 15, 1920, reviews briefly the research work done to date on the etiology of this widespread and devastating scourge. The article scrutinizes carefully the investigations of Ostertag, Casper, Sohlne, and Hardenbergh (Germany); of Kilbourne, Good and Smith (America); of van Heelsbergen (Holland); of Lignieres, Dassonville, and Riviere (France); and of McFadyean and Edwards (England). All of the investigations thus compiled show plainly that the causative agent is yet unknown and that its relation to contagious abortion has not been shown. Paniset shows the time-honored doctrine of Bollinger (1873) that the disease is due to a postpartum naval infection, has not been disproved and recommends that attention to the naval of the newborn should be continued and gives antistreptococcic serum and polyvalent vaccines as the best treatment. He advises that these be given intraveneously.

Scott (*Veterinary Record*, Feb. 1920), after favorable results in eleven mares, recommends the immunization of the expectant mother at the ninth month of gestation with a polyvalent bacterin containing streptococci, staphylococci and colon bacilli. Although the mares had previously yielded affected colts, only two were affected after the prophylactic vaccination and one of these was a mild case that made a recovery.—L. A. M.



## CANINE DENTISTRY

Drs. R. A. and David McAuslin, of the Brooklyn Veterinary Hospital have had some very successful experiences in undertaking dental operations on dogs, of the kind not ordinarily performed by veterinarians.

The above illustration shows Dr. McAuslin drilling a tooth preparatory to putting in a filling, an operation that is frequently performed in this hospital to avoid extraction of a tooth.

Dr. McAuslin resorts to every means that is used in human dentistry, to avoid or alleviate the pain.

DEPARTMENT OF

# CATTLE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Professor of Bovine Medicine, New York State Veterinary College at New York University, New York City

## Sterility

(Continued)

### Examination of the Uterus

AFTER the vagina has been examined and the rectum emptied, the operator will find it of great advantage to have an attendant pull the animal's tail to one side and keep her back flexed, rather than to allow her to stand humped up. This can be accomplished usually by pressure on the forward part of the dorsal vertebrae with any semi-sharp object, such as a nail or the end of a closed pocket knife, causing the organs to drop forward in their normal position and thus keeping the animal from straining against the operator.

After a cervix has been grasped and one proceeds to locate the fundus, and horns of the uterus, there are numerous abnormalities that may be encountered. I shall discuss those that are most frequently met with, attempting to differentiate their relative seriousness as affecting conception.

Some of the abnormalities are very easily recognized, but since the literature on sterility is comparatively meager, we not infrequently find conditions which put in doubt our prognosis. To illustrate, I recall examining a heifer that had reached the age of twenty months without having conceived. She was a fine individual of splendid breeding and the owner had asked his local veterinarian to examine her, which he did and informed the owner that in his opinion she would probably never breed as she had twin cervices. The owner's great interest in the animal caused him to later ask me to examine her. I found the condition exactly as reported to him by his local veterinarian. She had two apparently perfectly normal external os uteri, opening nicely and smoothly into the cervix. The anterior or endocervix appeared quite normal, as did the horns, tubes and ovaries, with the exception that the right ovary was cystic, having one cyst about the size of a hazel nut and another the size of a pea. The cysts were crushed and I informed the owner that I had never seen an exactly similar case, but reasoning from analogy, since the other organs were quite normal, and that there was no atresia of either external os, I believed the heifer would breed.

She was in heat eighteen days afterward, was bred and conceived, and on the 285th day dropped a nice heifer calf. I have a photograph of the mother and have been promised a photograph of the calf.

This was plainly an abnormal condition, but our literature, so far as I know, is silent on the probable prognosis of such cases.

Rather recently I found two interesting conditions on making an examination of all mature females in a herd of about 60, where nearly every animal suffered from a severe catarrhal vaginitis, which appeared on the 24th to the 72nd hour after service, lasting in most cases several months. Notwithstanding the apparent virulence of the vaginitis, some of the animals passing cupfuls of discharge daily, I found many of the animals that had been bred, pregnant. I think a superficial inspection of the herd would have led almost any one to believe that animals in such condition could not be

successfully bred, but the history showed that some of the pregnant animals had conceived on the second or third service, after being infected by the bull at the first service, and developing the discharg from the first service.

The vaginitis responded promptly to daily douching with saline and permanganate solutions, used on alternate days. In about two weeks the trouble ceased and all animals, with one exception, are still carrying their calves, many of them approaching the end of normal gestation.

Another interesting case I found in this herd was a cow with but one horn, tube and ovary, the left ones being absent. The right horn, tube and ovary seemed quite normal under palpation, and the records showed that the cow had dropped a normal calf some five months previous.

### Various Conditions Encountered in Examination

As we proceed in our examination some of the things we may ordinarily encounter are an enlarged fundus and horns, which we should palpate with great caution, to make certain we are not dealing with a pregnant uterus. This is the one thing every careful operator should keep constantly in mind until to his entire satisfaction he has eliminated the possibility of pregnancy, irrespective of the animal's breeding history, whether she was bred one week or one year before the date of examination is made. We may have already gained sufficient information from vaginal examination to give us a cue of what to expect. For instance, if we find the vagina closed, rather dry and sticky, as we near the cervix, it is a very reliable indication that a cervical seal is forming or has formed. On the contrary, if we find an excessive amount of clear mucus and the cervix more or less dilated, we are justified in considering the animal not pregnant and in suspecting estrum or cervicitis. If, however, there is a catarrhal exudate present in any quantity at the external cervix, we then suspect catarrh of the uterus, and I would like here to draw attention to the fact, that there is a difference in the character of a uterine catarrhal exudate and a vaginal catarrhal exudate. I regret I am not pathologist enough to define it nicely; the best I can do is to state that the vaginal exudate is lighter in color and more ribbon or bandlike. One might liken it to a piece of light yellow macaroni. The uterine exudate is usually slightly darker and coagulates more into a mass. By massaging the uterus a little with the cervix tilted into the other hand, one will get a greater or less quantity on the palm of the hand. This is true even of the very mild cases, while in catarrhal vaginitis the exudate will be smeared over the back of the hand and fingers in ribbons or chunks. Catarrhal vaginitis responds readily to vaginal douching with saline solution. Catarrh of the uterus is not so simply relieved.

### Examining at the Estrual Period

The time was when professional advice was sought concerning an animal that was not breeding regularly, that most workers, I believe, considered it advisable or necessary to examine the animal during the estrual period, but I think most workers will now agree that it is ordinarily the least desirable of all times to examine an animal. At least I confess that in examining a herd if I encounter an animal that is in the midst of the heat period, unless the ovaries and tubes are quite normal and the cervix but very little dilated, I am never quite sure when I have finished the examination, whether or not the cervix and uterus are entirely physiological. I am conscious of the fact that occasionally a mature cow that has given birth to several calves, may during the estrual period have a cervix so dilated as to admit the middle finger, and the fundus and horns be enlarged three times the normal size of the average uterus and still such a uterus may be entirely normal and that animal conceive that very day; but on the other hand, when handling a cervix or uterus of that kind, I am never quite as sure of its true condition as I would be if I could handle it in its restive state. The variation in size and texture caused by estrual congestion, can be learned only by numerous examinations. The texture, however, will give us some evidence in differentiating a catarrhal uterus from one congested by estrum. The former is usually soft and flabby, while the latter, as might be expected, being engorged

with blood, is stiff and firm, almost erectile in character; but, unfortunately, there is not always this marked contrast between estrual congestion and a case of mild chronic endometritis and cervicitis, and I personally believe there are cases where a positive differential diagnosis at the estrual period cannot honestly be made. The history of a case may assist somewhat, in that chronic cervicitis cases do not ordinarily have regular periods of estrum, *but be cautious of any set rule.* Pregnant cows do not ordinarily have periods of estrum after conception, but some do.

### Catarrh of the Uterus

Catarrh of the uterus is manifest usually by a more or less dilated cervix (sometimes very slight) and a varying enlargement of one or both horns, usually the texture of the horn is soft and flabby and the density may be greater than normal, giving it a thickened feeling, or the horns may be so flabby and thin as to be flat, so to speak, and with so little tone as to make it difficult to grasp them.

The seriousness in character may be determined fairly accurately by the amount of catarrhal exudate which can be pressed out by gentle and persistent massaging and the texture and tone of the uterine walls, nevertheless it is not an uncommon thing to find a catarrhal uterus from which can be massaged a half pint of thick catarrhal exudate and the uterus so flabby that to an inexperienced worker it might appear hopeless, to find on re-examining the organs five or ten days later that it is difficult to squeeze out over a tablespoonful of exudate, and the uterus so toned up as to make it almost unbelievable that it is the same organ. This is particularly so when such uteri are associated, as they so often are, with cystic ovaries and persistent corpora lutei.

The crushing of cysts, pressing out of yellow bodies, and the massaging of the horns, in a great majority of cases of catarrhal uteri, give results that are little short of phenomenal, and if not complicated with a plainly recognizable endometritis or cervicitis, are ordinarily very satisfactory cases to treat, responding promptly to a few massages, at from seven to ten day intervals.

Cases that are complicated with cervicitis or chronic endometritis, or uteri that are so flabby as to be almost spawnlike, are sometimes benefited by irritation (call it disinfection if you like), with such irritants as a one or two per cent solution of Lugol's, used one or more times at intervals of ten days to two weeks, to be discontinued, however, as soon as the uterus shows tone, the massaging to be continued until the uterus and ovaries appear quite normal. The vagina should then be douched daily with a saline solution and the animal bred at the first estrual period. As a word of guidance to those new in this work, I might state that I have thought uterine irritation of advantage in uterine catarrh, in about five per cent of my cases.

Do not treat too lightly, vaginal douching in any abnormal uterine condition. Daily vaginal douching with salt solution will keep the vagina in a healthy condition to receive the semen of the male, and if the douching be done with sufficient force, particularly daily for a week or so before breeding an animal, it will aid materially in relieving the vaginal cervix of any adhesive exudate that is often accused, and sometimes may interfere with the passage of the semen.—J. F. D.

CESAREAN SECTION

The calf shown above was delivered from the heifer by cesarean section. Both did well. The owner, Mr W. Dunham, Chesterfield, Ind., is holding the halter.—Dr. H. A. Smith, Anderson, Ind.

# Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of the AMERICAN JOUGNAL OF VETERINARY MEDICINE and no charge will be made for this service.

## Suspicious Poisonous Weeds

Dr. A. B. Yeager, of Lena, Ill., writes the following letter concerning some common weeds:

"Introducing the firm as readers of the *American Journal of Veterinary Medicine,* we are taking the liberty of sending you samples of a plant collected by us July 28. The old timers of our section call this plant wild lettuce or horse lettuce. It grows in small patches in almost every pasture. It appears to grow best on low land where the soil is the richest. It grows to a height of two feet. The stem contains fluid similar to that of the milk weed. Various animals eat it, the horse and more especially the cow. The symptoms are somewhat as follows: Animals eating moderate amounts become emaciated; eyes weak and sunken; the abdomen has a tucked appearance; pulse elevated; temperature generally normal, but may be subnormal. Constipation may be present, but more often there is slight diarrhea, the feces being foul smelling and containing bubbles. Digestion seems to be somewhat impaired. The animal seems to recover in most cases in three to four weeks.

"In severe cases death ensues in three to four weeks. The animal seems to suffer no pain but strains considerable. There is a discharge from the rectum and vulva in some cases.

"I have observed all these symptoms and no not know whether the trouble is due to this plant or to some microbe such as hemorrhagic septicemia. I would be pleased to have some comments from you on the matter."

REPLY: This communication is of interest as the Doctor has made some interesting observations.

The lettuce spoken of containing white liquid is often called milk weed and is a species of wild lettuce (*Lactuca canadensis.*) It is true that in Europe several species of the wild lettuce have been reported as slightly injurious. Many of the plants with milky juice have toxic properties—some very toxic. However, the wild species of lettuce are not regarded as very toxic.

The other plant sent to me is called the wild four o'clock or umbrella plant (*Oxybaphus nycetagineus*) and is widely distributed. This plant is considered bland in its properties and yet I do not know that live stock of any kind relish it as a forage plant. At least, we find that in most places it is not eaten. Probably there is something in the plant that makes it undesirable for live stock to eat.

A subsequent mail brought from Dr. F. D. Yeager another specimen of an introduced weedy lettuce, the prickly lettuce (*Lactuca Scariola*). This is the species which some European authors claim is poisonous. Cultivated lettuce, it is thought, is derived from this wild European species. This introduced species has become a most detestable weed in the United States. It is easily recognized by its leaves which are prickly on the under surface. *Lactucarium* is obtained from the milky juice of some species of lettuce. The physiological action of lactucarium, according to Dr. Millspaugh, is as follows:

"Lactucarium, in large doses, causes: delirium, confusion of the brain, vertigo,

and headache, dimness of vision, salivation, difficult deglutition, nausea and vomiting, and retraction of the epigastric region, with a sensation of tightness; distention of the abdomen, with flatulence; urging to stool followed by diarrhea; increased secretion of urine; spasmodic cough, oppressed respiration, and tightness of the chest; reduction of the pulse ten to twelve or more beats; unsteady gait; great sleepiness; and chills and heat, followed by profuse perspiration."

We are pleased to receive inquires of this kind from any of the readers of the AMERICAN JOURNAL OF VETERINARY MEDICINE.—L. H. P.

## SHORTS SUPPOSED TO CAUSE POISONING POSSIBLY ERGOT

Dr. J. H. Payne of Formoso, Kansas, sent a sample of shorts with the following letter:

"I am sending you a sample of some shorts taken from a shipment of twenty sacks received from Kansas City. These shorts seem to have caused trouble with my clientt's hogs and I would like to know if you think it harmful.

"One evening my client mixed up about a gallon of shorts in four gallons of water fresh from the well and fed it to four sows, nursing pigs, two or three weeks old, otherwise caring for them as usual. The next morning all the sows were sick and feverish and refused all food. During the day most of the pigs were likewise affected, nine dying later (there were about 49 pigs). The sows recovered in two weeks, showing improvement in a week in three cases, the fourth beginning to mend in ten days.

All the sows failed to give milk after being taken sick and the pigs had to be removed and fed. One sow's legs were doubled up so she could hardly get around. She would stand on the front of the fetlock joints and on the back joints. Another sow was so sore in her feet, she would not move around much. Both of these are still somewhat lame (two weeks after taking sick). The sow that was the worst is losing large patches of skin, just the epidermis, and the skin over the back, sides, and down the back of the hams is dead, cracked and beginning to peel off. The other sow has lost the end of her ears, the other two sows are about normal now.

"I did not post any of the pigs as I was sick at the time and unable to go out. I am a reader of the AMERICAN JOURNAL OF VETERINARY MEDICINE."

REPLY: I have been unable to find anything wrong with the shorts. I could find no corn cockle or any other injurious poisonous weed seeds, so there must have been some other trouble. However, we have received several letters in regard to the injuriousness of shorts containing seeds of wild buckwheat or bind weed. There does not seem to be anything of this kind in it. I do not feel that the trouble with the hogs can be due to the shorts. This acts a little like ergot poisoning, from your description. I suspect this may be the trouble.—L. H. P.

## HOGS POISONED BY YOUNG COCKLEBURS

Dr. E. H. Allinson of Gary, South Dakota, sends the following letter and also a specimen of young cocklebur:

"I am enclosing some specimens of young cocklebur plants for examination. Perhaps it would be unnecessary to enclose the specimens for they are very well known plants, but it is information concerning their poisonous properties that I want.

"Four hogs were turned into a field where there were lots of young cockleburs, but no other green plants. The next morning three of the four were dead and the other one was sick, but it recovered later and is in good health at present. Later another bunch of hogs on the same farm was turned into another field where there were quantities of cockleburs and were seen to eat the young plants greedily. The next morning one hog was dead and several sick, most of them being off feed to some extent. I was called to see if they had cholera but found no lesions of cholera. There was hemorrhagic exudate on the lining of part of the colon and congestion of the wall of the colon to some extent. The stomach was filled with grain and feed and appeared normal. There was no visible inflammation of the small intestines. The lungs were congested, but no hemorrhage was visible on any membranes.

"The sickest surviving pig had a tem-

perature of 99° F., no appetite and was unable to stand, seemingly paralyzed in the hind quarters.

"The owner said he had formerly fed full grown cocklebur plants to fattening hogs on dry feed with no bad results.

"What is the poisonous principle of cocklebur plants? Is it present in greater amount in young than old plants? Are the plants more poisonous some seasons than they are other seasons? What advice would you give about pasturing an infested field? The season is very late here and cockleburs are about the first thing that starts to grow.

Young cockleburs have frequently been reported as poisonous, and I have no doubt that they are poisonous. The injury from this plant probably comes largely from its mechanical action. As the involucre is indigestible, its herbs sometimes injure an animal feeding upon it. Stock will probably not eat very much of it, but on account of the hooked awns of the involucre the animal may have considerable difficulty in removing them. The hairs of the plant cause itching. Several cases of poisoning of hogs, probably due to this plant, have been reported to me. The plant contains the poisonous glucoside *xanthostrumarin* which resembles *datiscin*. On heating, the odor of succinic acid is given off. According to Chestnut, the young seedlings of three species of cocklebur, among them our Canadian cocklebur *(Xanthium canadense)*, are poisonous to hogs. Dr. Bitting was unable to find a poisonous substance in the growing plants. He thinks the injurious properties are largely mechanical.

I had a conversation with Professor Evvard the other day in regard to cocklebur poisoning. He tells me that he has fed a lot of young cocklebur without any injurious effects. In other words, he found that young cockleburs are not poisonous. He finds that the burs are injurious. These plants are readily pulled up in sandy soil.

### Asetake a Poisonous Fungus

K. Muto in an interesting article calls attention to the action of this fungus *Agaricus rimosus*.[1] Many years ago Kobert described the symptoms as those in the fly agaric. This particular fungus occurs in Europe, North America and Japan. According to the Japanese investigator, "The poisonous action of Asetake (sweat-fungus) agrees exactly with that of muscarine, in that an extract of this fungus in the cat increases secretion of saliva, sweat and bronchial mucus, acceleration of peristalic motion, slowing of the pulse and myosis.

"The poisonous action of this extract accords with that of muscarine, in that myosis produced in the cat by the extract is due to the irritation of the peripheral ends of the *nervus oculomotorius*.

"In conclusion it remains to be considered why there is a difference between the symptoms of poisoning in man and in cats. The nerves that innervate the sweat glands both in man and in the cat belong to the parasympathetic system as I have shown. It is my belief that the sensitiveness of the terminals of these nerves to the action of muscarine is much greater in man than in the cat, hence perspiration is induced in man by a slight degree of poisoning, while salivation, bronchial rales, vomiting and diarrhea are brought on in his case only by large doses. In the cat, on the contrary, only a strong degree of poisoning elicits perspiration along with the other symptoms named.

[1]Journal Pharmacol. & Therap., 11: 147-158.

## TUBERCULIN: ITS REACTION AND USE

*(Continued from page 368)*

consideration and recognize every fact that would have a direct bearing, might lead to error in diagnosis, and reflect most disastrously either upon the veterinarian or the tuberculin test. Our constant ambition should be directed toward accuracy in the use of tuberculin as a positive means for the detection, control and eradication of tuberculosis.

And may we forever remember that no biologic test reaches its maximum value in the absence of a thorough knowledge of reactive phenomena.

## LITERATURE MARKS ADVANCE OF SCIENCE

Books are the monuments of learning: they are the records of the knowledge of the past. The general advancement of an art or science is in proportion to its literature.

E. WALLIS HOARE, F. R. C. V. S.

DEPARTMENT OF

# SWINE PRACTICE

Edited by A. T. KINSLEY, M. Sc., D. V. S.

## Deficiency of Mineral Salts Causes Trembles

I am writing for information concerning some litters of pigs. The sows gave birth to good litters and the pigs seem in good health in every way, except that they shiver and tremble all the time, and they do not seem to outgrow it. When they start to run, they fall down.

I vaccinated some of them for hog cholera when they were one week old and they came through it all right, but they still have the trembles.

Any information you can give me about this condition will be appreciated.—B. H. B., Iowa.

REPLY: I am unable to make a diagnosis from the description that you give. I am wondering if you have eliminated the larval form of ascarid which causes a variety of disturbances, or it may be a dietary disturbance.

If you are unable to incriminate the larval form of the ascarid, I suggest that careful attention be given to the feed. It is possible that the disturbance may be a dietary one traceable to the feed the sows are getting.

If you will autopsy one or more of these pigs, we shall be glad to hear from you with a detailed account of any lesions that you may find.

A common dietary disturbance in young pigs is due to a deficiency of lime salts in their feed, and in the feed of the sows. The treatment is large quantities of lime salts and particularly calcium phosphate. If this is administered to the sows for a couple of weeks, you may see a marked improvement in the sucklings.

Bear in mind the great drain that pregnancy and lactation entails upon the mother for mineral matter, and also the fact that many nutritious feeds are deficient in mineral matter, particularly in the calcium salts. It is now believed by not a few investigators that superiorty of alfalfa as a feed is due more to its high content of calcium salts than to the large amount of protein that it contains, as was formerly thought.—A. T. K.

### LIME SALTS INDICATED FOR RICKETS

I should like to have some information in regard to conditions in suckling pigs that has me very much puzzled and baffled.

The pigs appear healthy and are thrifty. Suddenly they become weak in the hind quarter and wabble around. Some can travel all right for a distance when they fall over. Most of them die in two or three days after this condition appears, but some of them live a week. Very few recover.

I have held a postmortem examination on several, and in only one herd did I find any lesions and they appeared to indicate swine plague.

The affected pigs are mostly four to six weeks old. They have been fed a variety of feeds and have plenty of range grass. I should like to have a diagnosis and treatment prescribed. No treatment that I have given has benefited them.—F. A. K., Iowa.

REPLY: Considerable loss has been reported from your part of the state from invasion of the lung by the larval form of the ascarid, but it does not seem likely that this is the trouble in the pigs you describe.

We are inclined to think that your pigs are suffering from rickets. This, as you know, is a digestive or dietary disturbance resulting from insufficient lime salts, and

we advise that you administer lime salts in large quantities, particularly the calcium phosphate. We believe that the pigs will make a complete recovery in about ten days, or thereabouts, following such treatment.—A. T. K.

## BARRENNESS PROBABLY RESULT OF INBREEDING

I am writing you regarding the condition of a valuable sow, of the spotted Poland China breed, owned by a prominent breeder in this vicinity. She was of a litter farrowed in March, 1919.

She was bred five times in succession when in season, twice to the same male, three times to different males, but failed to conceive. She is apparently in perfect health and in good flesh. No abnormal conditions can be detected on examination. Can you advise any treatment for this condition of barrenness, and give any cause for her not becoming pregnant? If this sterility could be overcome, as a breeder the sow would be worth between $1,500 and $1,800.—R. E. J., Ill.

REPLY: The description you give of the spotted Poland China sow is rather typical of barrenness, the result of inbreeding. You did not state in your letter the breeding of this sow, and we would suggest that you determine this point as it will make some difference in the outcome of the case.

We have had reports of several other such instances from inbreeding and only a few of these cases have been successfully corrected. If this sow is not inbred then we believe the chances for relief of the barrenness are fairly good. We would advise that yohimbin be given to this animal, giving full therapeutic doses, using either the fluid extract or special preparations that are available and continuing the treatment for a period of ten days prior to the period of heat. If this sow is inbred, the chances are that it will require a longer course of treatment with the yohimbin, and only a relatively small percentage of such animals are relieved of barrenness by this treatment.

Other than this we have nothing to suggest in this case, as you have stated in your letter that the animal is apparently normal. If there were any vaginal discharge it would indicate some infection and would necessitate douching with a weak solution of iodin and carrying out this treatment practically the same as in uterine infection in the bovine.—A. T. K.

## DISTURBANCE PROBABLY DUE TO DIETARY DISTURBANCES

I would be glad of any information you may be able to give me regarding these pigs which have given me more trouble than anything I have encountered in all my practice.

The pigs seem to be all right one day, but stiff and staggery or die the next day. They are as stiff as though they had tetanus. They lose their appetites; bowels normal. The heart, liver and lungs all appear to be normal on postmortem examination. Any information will be most acceptable.—E. A. C., Ind.

REPLY: From your description it is not possible to make a positive diagnosis; however, I am inclined to believe that the malady may well be included in the group designated as toxemia or auto-intoxication.

It is possible that the disturbance is of dietary origin and the deficiency is due to some disturbance in the sow. Many such cases have been reported to have recovered following a change of the sow's diet, particular care being taken to see to it that such hogs receive an ample supply of lime salts. It is also possible that this condition may be due to the invasion of the larval ascarids, which are known to cause a variety of disturbances. Such cases are not subject to remedial treatment, but the condition is effectually prevented by eliminating the intestinal worms from the sows previous to farrowing and placing the animals in clean quarters that have not been recently inhabited by swine.—A. T. K.

## VACCINATING WEEK-OLD PIGS

In giving the dosage for vaccinating week-old pigs on page 331 of the July issue, through a typographical error it read "The dosage, generally speaking, should be 1 cc of virus and 2 cc of serum, increasing the serum for larger pigs." Whereas, it should have read: "1 cc of virus and 20 cc serum."

# Department of Laboratory Diagnosis

Edited by Dr. C. A. Zell

## Pyemia in A $10,000 Bull

I am today shipping, in a four per cent formalin solution, specimens of the mesenteric lymph-glands and of the posterior mediastinal lymph-gland. I desire particularly to know if tubercle bacilli are present in these specimens.

These specimens are from "King Fan of Rock," a Holstein bull five years old, and valued at $10,000.

This animal was hard to get into show condition last fall, otherwise has appeared normal. April 24, 1920, he developed an impaction which recovered from treatment with barium chlorid and tartar emetic, followed by oils. Two days later, superpurgation set in, but this was checked with powdered opium, tannic acid and salol in capsules.

The temperature fluctuated, but on May 5, the herdsman telephoned me that the animal was much better and recovery looked certain. He died that night.

AUTOPSY: The stomach and intestinal contents were normal. There was a growth about the size of a barrel head in the abdominal cavity just posterior to and attached to the diaphragm. The growth consisted of multiple abscesses and contained an offensive smelling mucopurulent fluid. The lymph-glands of almost all organs were either very dark or greatly enlarged and caseous, but not calcified.

Diagnosis: Pyemia.—R. E. W., La.

REPLY: Owing to a mistake in shipping, the specimens referred to above were not received at the laboratory until twenty days after they were removed from the animal. Nevertheless, they arrived in good condition. This, together with the fact that some rather large specimens (whole fowls) packed in borax have recently been received so decomposed as to render an examination impracticable, emphasizes the superiority of formalin as a preservative for tissue specimens. Where the specimen is large, it should be placed in a can in a four per cent solution, and the can soldered. Otherwise, from rough handling in transit, it is almost sure to leak.

Macroscopically, the lymph-glands had the appearance of a tumor, but microscopically they proved only to be infiltrated with pus and cheesy degeneration.

There were no tubercle bacilli, but many staphylococci and a gram negative bacillus probably of the colon group. Further, on sectioning, the typical signs of tuberculosis were missing. There was no giant-cell accumulation and no round-cell infiltration at the border line of the degenerated tissue.

Your diagnosis of pyemia was correct.—C. A. Z.

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### MENINGEAL FORM OF HEMORRHAGIC SEPTICEMIA IN SWINE

I am mailing you a specimen of hog blood for the laboratory service that you have recently announced that you are extending to subscribers.

The symptoms displayed by these hogs have baffled me. I think I know the symptoms and the postmortem lesions of the common swine diseases, but the sow from which this blood was taken displayed symptoms that I couldn't describe as other than "dancing fits." She showed no digestive disturbances and no external lesions.

Upon postmortem examination, I found congested, purple colored, mediastinal lymph-glands, the lungs showing a dark mottled appearance. Sections were in a state of red hepatization.

The sow's six weeks' old pigs acted as insane as she did. I killed one and on postmortem examination, found the vis-

ceral organs and glands absolutely normal, yet these pigs were helpless while alive, but ate fine when food was lifted up to them. Let me know your findings and diagnosis.—E. H. H., Mo.

REPLY: The specimen of blood contained a number of bipolar organisms of hemorrhagic septicemia. You undoubtedly have to deal with hemorrhagic septicemia and judging from the symptoms given in your letter, a meningeal form of this disease.

Hemorrhagic septicemia bacterins should be given all swine on the premises.—C. A. Z.

## ENDOTHELIOMATA IN A DAY-OLD COLT

I am sending you the anterior lobe of the left lung and a small portion of the small intestine with the mesentery attached, which were taken from a colt that I was called to see recently.

This colt dropped to the ground, rolled and tried to balance on its back, and would lie flat on the side and often in a much twisted position. When standing, the colt would stretch out as far as possible. This was the only position in which it would remain quiet, sometimes standing in this position for half an hour.

The respiration was 35, temperature 101.4° F., pulse 100, full and compressible. Conjunctiva very red. There was some peristalsis, but the bowels did not move until a high enema of very warm water and a small amount of glycerin was given, the resulting meconium being very solid and in pellets. The colt urinated four times during the day. The urine was clear and normal in amount.

DIAGNOSIS: Colic, probably due to fetal accumulation in the bowel.

TREATMENT: Two drams of natol was administered together with twenty minims of fluid extract of nux vomica and one dram of aromatic spirits of ammonia. The colt seemed better after the treatment.

The following day the respiration was 40, and intermittent, the animal taking two or three breaths and holding it for a few seconds. The temperature was 104° F. Pulse 130, soft and difficult to detect. The conjunctiva was very dark red, resembling raw beef. There were no peristaltic sounds. The kidneys were not functioning. The colt stood stretched out most of the time. When recumbent, it lay on the side stretched out. The natol passed from the colt in 10 hours.

The colt died at 7 p. m. Postmortem examination held immediately following death showed that the blood was very dark and coagulated quickly upon coming in contact with the air, the serum turning to a dull white. The stomach and intestines were almost empty. The bladder was empty. The liver was of a dark red color with brown patches, the patches being firmer than the remainder of the organ. The mesentery of the small intestine was much changed and presented a congested appearance.

The lungs were much congested, more particularly the left one, and there were many indurated areas on the lung surface. The heart muscle was solid and of normal color.

This is the second colt that was lost on this farm in the same way. The first colt was foaled in the barn; the second in a pasture. The umbilical vessels showed no change. Any information you can give me through the columns of the JOURNAL will be much appreciated.—C. R., Idaho.

REPLY: The specimen of lung and intestine referred to above were received in good condition.

The case is a most interesting one because of the rare condition found in the lungs. The indurated areas mentioned occurred all through the segment of the lung sent, and were so firm as to suggest calcareous deposits. On microscopic examination they appeared to be multiple endotheliomata. It is more than probable that the firm brown patches that you describe as being present in the liver were of the same nature. It is regrettable that a portion of the liver was not included with the specimen.

The congestion in the intestine and mesentery seems to be secondary and was probably due to the congestion in the liver and the consequent obstruction to the circulation through it. Endotheliomata in an animal so young as this one is very rare. That it should have occurred in two cases on the same farm, if the death of the other colt was in fact due to this cause, is certainly remarkable.—C. A. Z.

## COMPLEMENT FIXATION A HERD AND NOT AN INDIVIDUAL TEST

I notice that you are establishing a laboratory service department in the Journal for subscribers, and I wish to inquire whether I might send samples of blood from a herd of cattle for the complement fixation test for contagious abortion. I am convinced that contagious abortion exists in this herd and I wish to pick out the affected animals and place them under treatment.—H. A. G., Ill.

REPLY: We shall be very glad to apply the complement-fixation test to blood specimens that you may send us from this herd. However, this test for abortion in cattle is not regarded as of much value for individual animals. Its value lies in its application to an entire herd, where it indicates whether or not contagious abortion exists. That is to say, it will not reliably point out the individuals that may or may not be affected with abortion, but will indicate whether or not abortion exists in the herd.

If you care to have us do so, we will send you sterile containers in which to collect the blood.—C. A. Z.

## MENINGEAL HEMORRHAGIC SEPTICEMIA

Under separate cover, I am sending you a blood specimen from a two-year-old heifer, with a four-week old calf. She and two more heifers were suckling their calves, all about four weeks old, all heifers being about two years old.

These animals pastured on rye pasture, that had been overflowed by a sewer this spring, and except during the night when they were left in to nurse the calves, they were out on this pasture with milk cows and heifers, one to eight or nine years old, numbering about fifteen in all.

This morning, May 18th, I was called to the place. One heifer was dead. She had been apparently all right the night before. The other, or the one from which the blood was sent, was showing considerable cerebral disturbance. Looking around as though she had lost her calf, with a bellow now and then. She had a jerky movement of the head, chewing of jaws, with some saliva about the lips. There was no bowel disturbance, but loss of flesh was rapid, going off one hundred and fifty pounds in a few days.

This heifer seemed sluggish Friday, but ate and drank and had no brain trouble until this morning, May 18. The calves are all all right, no bowel trouble.

The animal from which the blood specimen was taken, died while I was driving home. The remaining one of the three, seems well so far, as do all the others.—H. E. B., Indiana.

REPLY: The specimen arrived in good condition.

Bacteriological and cultural examinations revealed no bipolar organisms, nor anything else that might account for the condition.

The symptoms you give are certainly indicative of mad itch, or the nervous form of hemorrhagic septicemia, and such a diagnosis would appear to be justified regardless of the negative findings in the blood. We advise the use of hemorrhagic septicemia bacterins on the remaining animal.—C. A. Z.

## SEND SPECIMENS FROM "ACTIVE" AREAS

The specimen sent you was taken from the neck of a Jersey cow, five years old. This cow developed a swelling just posterior to the parotid gland, about four weeks ago. The swelling was hard, painless and somewhat oblong, and extended along the trachea some six inches.

The breathing became laborious, the animal lost its appetite and lost rapidly in condition. It did not cough.

The swelling increased in size rapidly until it interfered with the breathing alarmingly.

I thought at first this was a large hematoma and incised the swelling and evacuated about a quart of blood, washed out the cavity very thoroughly and left the incision open for drainage.

The wound did not heal. I kept irrigating it and had the neck bathed with hot water three times a day. For a time the animal seemed to improve, but lately the swelling has increased so much that the neck is swollen from the head to the brisket, and breathing is much affected.

Today I opened the abscess a second time. The entire swelling seems to be composed of the same material as that

sent you. I want a thorough laboratory examination and the findings sent me at once.—A. J. W., Virginia.

REPLY: The material received was a gray-like, cheesy mass that showed no histological structure. The bacteriological examination revealed no pathogenic organisms.

It is evident that the proper specimen was not sent for examination. Apparently this tissue came from near the center of the tumor where degeneration had long since destroyed any evidence of the diseased condition bringing it about, and remote from the present scene of activity, since no organisms that could account for the condition were found.

This is a point to remember. In sending tissues, particularly for bacteriological examination, they should be taken from areas where the disease process is active. In a large swelling or abscess that is increasing in size, they should be taken from near the periphery.

The laboratory findings do not justify an opinion as to the diagnosis, and the doctor who saw the case is in a better position to make a diagnosis from the clinical symptoms than anyone else.—C. A. Z.

# Queries and Answers

## BEAUMONT OIL FOR SARCOPTIC MANGE.

I have under observation a horse which I believe is affected with sarcoptic mange. The owner lives 100 miles from Pasadena and has called me twice to see the animal and at the last visit stated that if he didn't get results he was going to call me again.

The history of the case is that the animal has been affected for over a year, has been apparently cured at times only to break out again. At present the head and neck are hairless, skin thick, wrinkled and other patches are on the body. The skin is cracked and raw in places.

The treatment that I have prescribed is to loosen up the crust by scrubbing with a hot compound cresol solution, then a thorough application of the B. A. I. lime and sulphur dip with a brush, with further treatment of the raw places with carbolic acid and camphor a.a.

I took a microscope along on the last visit but was unable to locate the mange parasites. I was unable, however, to find any affected area that had not been treated.

The owner is convinced that the horse is affected with ringworm so I examined hairs for this affection also. I told him that he might treat a small area with tincture of iodin.—J. B. B., Calif.

REPLY: The problem of treating a single case of sarcoptic mange, and particularly in treating this case one hundred miles from one's office, is not an easy one.

The ordinary lime and sulphur dip or the arsenic dip applied hot, is successful in these cases; but it is ordinarily necessary to repeat it two or three times. For a single case, you could not afford to build a dipping vat, and hand application is apt to be poorly done: that is, areas would be missed or the dip allowed to cool too much or to settle during the application so that part of it is not strong enough.

Veterinarians who were in the army, report very excellent results from a thorough application of Beaumont crude oil. Usually but two, and in no case more than three applications are required. To prepare for it, the animal is first thoroughly washed and scrubbed with a solution of green soap, to which has been added liquor cresolis compositus, U. S. P., to make a solution of ½ to 1 per cent (not stronger).

Beaumont oil is superior to other crude oil because of the considerable percentage of sulphur that it contains in solution.

Mange parasites are ordinarily not very difficult to find, and the fact that you could not find them with the microscope in un-

treated areas raises the question in my mind whether the condition is mange.

## MORE ABOUT CORRECTION OF MINERAL DEFICIENCY IN DIET

How much finely ground rock phosphate, finely ground bone-meal and finely ground limestone would you feed to unthrifty young colts and calves per day? Also dry peat?—P. L., Colo.

REPLY: Henry's "Feeds and Feedings" deals with the subject at great length. It appears to be the opinion of Henry and many other investigators that certain feeds contain all the calcium and phosphorus necessary. Feeds that contain the largest amount of these elements are the legumes. Bran and cottonseed meal are very deficient in it.

Henry places the amount of ground rock phosphate and bone-meal necessary for animals on a diet deficient in calcium and phosphate at two ounces per day.

## PARALYTIC CONDITION IN SOWS MUCH EASIER TO PREVENT THAN CURE.

I would be glad to have some information on paraplegia in sows after farrowing. I have a case where two out of three sows were unable to get up on their hind legs after farrowing. Both sows are about a year and a half old; weigh around 225 pounds; eat and drink, but the posterior limbs seem to be completely paralyzed. About two weeks have elapsed since farrowing time.

The sows have been confined in close quarters all winter and the principal feed has been middlings—no corn. The young pigs are all healthy, and the quality of the sows' milk does not seem to have been impaired.—M. A. K., Ill.

REPLY: There is just a possibility that the sows may have been paralyzed as a result of injury to some of the large nerves during farrowing, but from the history you give, the chances are very much greater that the condition is due to a deficiency of lime and phosphorus in the feed.

I should immediately give these animals one ounce a day of ground rock phosphate and ground bone meal, and add to their diet some of the feeds rich in calcium and phosphate, such as alfalfa, peas, beans or other legumes.

Bran and middlings are quite deficient in calcium and phosphate, and during the development of the fetuses, the sow fed upon those feeds draws upon her own phosphate and calcium in the bones for the growth of the fetuses.

The condition you have to deal with is far easier to prevent than it is to cure, and you will serve your client best by putting the animals not yet affected on the feed suggested above, and preventing the extension of the trouble.

## UNDETERMINED POISONING OF DAIRY COWS

I was called to see forty sick cows in a herd of fifty. Two had died the day before, three more died after I gave treatment. The rest all made good recoveries.

The attack came on suddenly and the animals had diarrhea, the feces being mixed with blood. Those that died were unable to stand for a few hours before death, and two of them died in convulsions.

I gave each cow stimulants and two pounds of epsom salt, and stopped the feeding of the silage and the hay and grain which the animals were being fed at the time they were taken sick.

About a week later, the owner gave four of these cows the same gluten feed that he was feeding when his herd was attacked and all four of them showed the same symptoms as the animals in the first attack.

This leads me to believe that it is the gluten that is at fault, and I am sending you a portion of it by this mail.—E. J. R., N. Y.

REPLY: The sample of feed sent was forwarded to Dr. L. H. Pammel, who reports as follows: "We have examined the material for weed seeds, but find nothing in any way harmful or irritating. We will send some of the gluten to the Chemistry Department for further inspection."

Dr. A. W. Dox, Chief of the Department of Chemistry of the Iowa Agricultural Experiment Station, replies: "We find no evidence of any poisonous ingredients. We fed the material to two rabbits, neither of which developed any abnormal condition."

## REQUIREMENTS FOR MATRICULATION AT VETERINARY COLLEGES

What are the educational requirements for admittance to accredited veterinary colleges at the present time?

I have a young friend who is considering taking up the study of veterinary medicine and who has asked my advice in the matter.—J. H. D., Iowa.

REPLY: The rules of the United States Department of Agriculture, approved by the Civil Service Commission, governing entrance to accredited veterinary colleges are as follows:

1. The matriculation requirement for admission to accredited veterinary colleges shall be four years' high school education, of fourteen full units or their equivalent. The possession of this education by the student must be evidenced by approved credentials.

2. Admission on credentials must be based on credentials authenticated by the active superintendent, principal, or head master of a school that is listed as accredited by the United States Bureau of Education.

3. If the applicant received his education in any other than an accredited secondary school, the equivalent of that education to fourteen full units must be certified in each individual credential by—

(a) The state commissioner of education (or a similar officer) of the state in which the education was received.

(b) The chairman of the admission committee of a university which is a member of the Association of American Universities, or the chairman of the admission committee of a university which is a member of an association of state universities.

An applicant having a diploma from a recognized college or a normal or high school shall be eligible for admission without examination.

No other forms of credentials than those specified shall be considered acceptable.

4. Students may be admitted to accredited veterinary colleges on examinations instead of credentials, provided the examinations cover the ground represented by fourteen secondary units and are held under the direction of one of the officers mentioned in Section 3 of this regulation and the extent and record of the examination is certified by one of the officers mentioned in said section. No other examiners are considered acceptable.

5. The last entrance examination shall be held not later than fifteen days subsequent to the advertised annual opening of the college year, and no time credit shall be allowed to students admitted after that date.

6. Any person applying for admission to a veterinary college shall present, before being enrolled, the credentials or certificate of examination required by these regulations, and in no case shall he be admitted until he has complied with these requirements.

7. All accredited veterinary colleges shall keep on file, for at least five years, the credentials or certificates of examination of all persons admitted as students in veterinary science.

The requirements of the A. V. M. A. are substantially the same, except that fifteen instead of fourteen units of high school work are required.

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## OLEANDER POISONING

Cow, sick twelve to fifteen hours when I was called.

Symptoms: Heart very fast and weak, missing occasionally; eyes very dull; ears dropped; rumen hard and swollen; respiration fast, with slight grunt with the expiration; great depression generally.

This cow was on dry feed. She was fed some grass from the lawn, which had been raked from under and around some oleander trees. The owner insists that she ate this grass and leaves.

Treatment: One pound of epsom salt, one-fourth grain strychnin, one ounce aromatic spirits of ammonia, 30 grains aluminun sulphate, 10 grains permanganate of potash. Strychnin and ammonia was repeated every three hours.

The cow made a complete recovery and had regained her normal flow of milk in about ten days.

Was it oleander poison?—H. O. R., Arizona.

REPLY: Oleander is one of the well-recognized poisonous plants of Northern Mexico and the Southwestern United States. Numerous references to it may be found in Pammel's "Poisonous Plants." Prof. F. W. Wilson of the Arizona Experiment Station made some investigation of poison by this plant and reported in part: "The general symptoms are increased temperature and pulse, coldness of the extremities, warm body temperature, dilation of the pupils, discoloration of the mouth. The animal generally refuses to eat or drink twenty-four hours preceding death. The bowels act often and the feces are usually greenish in color. Urination is increased. It is safe to say that many hundreds of animals have been lost in southern Arizona from eating this shrub."

For fuller information, including a de-

scription of the shrub and several illustrations, see Pammel's Manual of Poisonous Plants.

## UNEXPLAINED LOSSES FROM ANESTHETICS

I have been using the A. C. E. mixture for anesthesia in dogs for fifteen years, with satisfactory results.

On leaving the army and resuming practice again, I did not, at once, procure a federal permit to obtain alcohol, and so, in making up the A. C. E. mixture, I was compelled to use denatured alcohol. I selected alcohol denatured with bichlorid of mercury and used it twice and had all kinds of trouble both times. In one of the operations, a strong, healthy Boston bull died on the table, the first healthy dog I have ever lost in this way. I blamed the bichlorid of mercury with which the alcohol was denatured. Am I right?

After this experience, I procured a permit and obtained pure alcohol, and since have performed several operations with the same good results that I had when the country was wet.—J. W. G., Utah.

REPLY: Bichlorid of mercury is not volatile at the temperature at which an anesthetic is used, and none of it would pass over with the fumes of the A. C. E. mixture. Your bad results were apparently due to some other cause.

## POSTPARTUM PARALYSIS AND FORAGE POISONING

Several months ago, I treated a case that developed in a large Holstein cow, in poor condition and very weak. She calved normally, or at least without assistance, but afterward could not get up. I used hot bran poultices on the loins and administered tincture of nux vomica and tincture of ginger. In four days, she got up and has been well since.

Eight weeks ago, I was called to a case that at first showed the same symptoms, but resulted very differently. This was a well-fed Holstein cow, who calved normally, but was grunting considerably afterward, and when she lay down, could not get up. I used the same treatment as in the first case, and the patient got up in four days, and seemed perfectly well and gave a good flow of milk for ten days, when she suddenly became unable to swallow and totally blind, although her eyes appear entirely normal. I gave her potassium iodid in considerable doses.

After a week, she began to swallow bran swill and to eat hay if it were put in her mouth, and in a couple of days, she began ruminating slightly. Throughout this period, defecation and micturation were normal, and she gave a good quantity of milk, though remaining totally blind.

She took no notice of anyone, acting as though she could not hear, feel or see. After she commenced to drink the bran swill and to eat a little hay, she was fed what she would take in this way, and occasionally drenched to get some water into her, for more than two weeks, at the end of which time she showed a good deal of improvement, and was able to get up with help.

In another week, she was nearly normal. She continued to give some milk throughout the ailment. The potassium iodid and nux vomica were given throughout the attack, except once when we changed to sodium iodid, which caused extreme constipation. Magnesium sulphate was given to relieve it but without success. It yielded to barium chlorid, however, but this appeared to greatly weaken the patient.

This cow received no ensilage at any time. She was fed on clean hay, cut on bottom land, and ground oats, corn and bran.

What was the matter with her, and was the second attack in any way connected with or dependent upon the first?—S. J. A., Minn.

REPLY: To answer your last question first, No. We should say that the first attack was a fairly typical case of postpartum paralysis, and in no way connected with the latter affection.

Postpartum paralysis of varying duration, from one or two days to perhaps weeks, is by no means rare in Holstein or other cows where the calves are large. It is nearly always more severe where labor is prolonged or where much traction is necessary to remove the fetus, but the anterior gluteal and obturator nerves are apparently occasionally injured in cases of parturition that appear quite normal or comparatively easy. These are usually the

cases that recover in one to three or four days.

The second attack seems to have been one of that rather large group of cases which, for want of a better classification, we term forage poisoning—some call it botulism. Being due, as such cases probably are, to a variety of different toxins, the symptoms vary greatly, but they have some fairly characteristic and constant symptoms, principally manifestations of nervous disorder, either excitability in varying degrees from nervousness to frenzy, or stupor varying from conditions so mild as to scarcely be noticed to complete coma.

Incoordination of the locomotory apparatus, paralysis of the deglutitory muscles and blindness are also fairly constant symptoms. Of these, paralysis of the muscles of deglutition is the most constant and is quite apt to be present in all stages of both the excitable and comatose forms.

Spoiled silage, rotten potatoes and hay that has been overflowed before cutting, are the commonest sources of forage poisoning, but no feed has been exempt and while one would be inclined to incriminate the hay in this case, the possibility of it being in the bran, the oats or the corn should not be overlooked.

A peculiarity about many attacks of forage poisoning and one that is always difficult to explain to the owner, is the fact that, except in the worst outbreaks, only a part of the animals eating the suspected feeds are attacked; in some cases, only one animal, and sometimes after recovering from an attack, animals can eat the feed that originally caused the trouble, with impunity.

Until we know more about what forage poisoning actually is, no satisfactory explanation of these peculiarities can probably be made in some cases. In others, it is to be explained by the varying resistance of different animals to toxins, by the varying amounts of toxin consumed by different animals and by the varying conditions under which it is consumed. Often the damaged feed is less palatable than the good and is eaten only by the more timid animals in the herd—those that are driven away from the choicer feed by more pugnacious members of the herd. Again, the opposite appears to be the case, and the stronger animals, those getting the feed first, are the ones that are poisoned. Undoubtedly the amount of feed in the stomach when the poisonous feed reaches it has a bearing on the outcome, as perhaps does also the drinking of water before and after eating.

## COLIC FROM INDETERMINABLE CAUSE

I was called to a case this afternoon and found the animal dead when I arrived. It was a twelve-year-old black mare, weighing about 1,300 pounds and due to foal in one month. She had been fed hay and oats regularly, but not overfed, and was apparently well until this forenoon. She did not eat all of the oats given her at breakfast, and at ten o'clock began showing violent pains, which lasted until she died, five hours later. The owner had no idea as to what caused the illness.

I held an autopsy one and one-half hours after the animal died, and the only abnormal thing noted was the condition of the double colon. It was dark red and very friable. The stomach was almost empty and appeared normal, but contained quite a quantity of gas. The small intestine was normal. All fluid in the intestines was quite liquid.

Could one call this septic enteritis?—J. L. S., N. B.

REPLY: Manifestation of violent pain is indicative of trouble in the stomach or small intestine rather than in the large intestine. The findings seem insufficient upon which to base a diagnosis, but indications point in some degree to the intestinal form of hemorrhagic septicemia as the cause of death.

## BEST IN THE WORLD

I can make no suggestion for the betterment of the Journal as it's the best in the world anyway. Hoping you keep it to its high standard I am.—A. J. D., D. V. S. Bisbee, Ariz.

## ANIMAL HUSBANDMAN

The U. S. Civil Service Commission will hold examinations August 17, 1920, to fill the position of animal husbandman, in the B. A. I., salary, $1,800-$2,500. Applicants should at once apply to the C. S. Commission, Wash., for Form 2118.

# POINTED OPINIONS by Readers ON LIVE TOPICS of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

## Diseases of Animals that Interest the Practitioner of Human Medicine

The relation of diseased meat and impure milk to public morbidity is a question that should vitally interest every one, especially the general practitioner of human medicine.

The diseases of animals that should be of special interest, are those which are transmissible to man by direct contact or direct contagion, or indirectly through the medium of meat or milk.

1. Anthrax is a true septicemia caused by the Bacillus anthracis. It is readily communicated to man and all warm blooded animals. This organism has the distinction of being the first disease-producing germ, stained, isolated and described. This marked the beginning of our present-day knowledge of bacteriology.

2. Glanders is a contagious disease of the horse and many other animals. It attacks the lymphatic system, the mucous membranes and the skin. The symptoms are chronic nasal discharge, ulcers on the schneiderian membrane, enlarged submaxillary glands, and ulcers on the extremities. At least three of these symtoms must be present to justify the diagnosis of glanders. But we are fortunate in having a biologic test for this disease—the mallein test. Mallein is a glycerin extract of the dead Bacillus mallei. Both of the recognized tests, the subcutaneous and the opthmalic, are reliable and practicable. Glanders in man rapidly reaches a fatal termination. Horses may survive for months or years before they succumb.

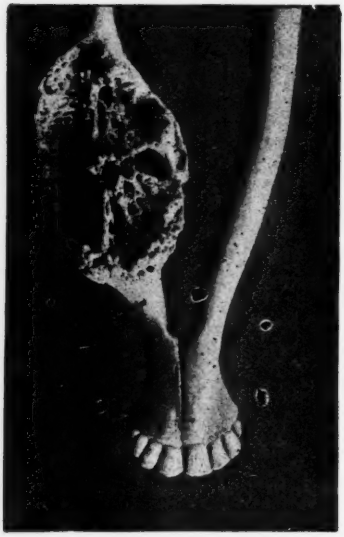
3. Foot-and-mouth disease is a highly contagious disease of all cloven-hoof animals. It manifests itself by ulceration around the feet and mouth, its specific cause, a filtrable virus, has not been isolated. This disease is transmitted to man by direct contact, or possibly through the medium of milk from affected cows.

4. Trichinosis is a parasitic disease due to the Trichina spiralis, which becomes inbedded in the muscular tissues of animals, principally swine. It is transmitted to man through the medium of infested meat, which has been eaten when raw or imperfectly cooked. Two per cent of all American hogs are infected with Trichina spiralis. Don't eat raw pork.

5. Actinomycosis is an infectious disease caused by the ray fungus. It usually attacks the cheeks, jaw bone and tongue of cattle. This disease has been transmitted to man but the manner of its transmission is not well understood.

6. The taenia echinococcus, causing in man the hydatid cyst, the beef measle, causing in man the taenia saginati, and the pork measles causing in man the taenia soleum, are perhaps more common than is generally realized.

7. Rabies is an acute infectious disease transmitted from animal to animal and from animals to man. The period of incubation is given as from 18 days to as long as two years. I doubt somewhat the two-



Lower jaw of beef affected with actinomycosis.

year statement. I have had an opportunity to observe this disease rather extensively, having seen it in the dog, the horse and the cow, also in hogs and in man. My observation is that the period of incubation is from 18 to 35 days. In all cases of dog bite it is advisable to destroy the animal and send the head packed in ice to a laboratory for a microscopic examination.

8. There is available at the present time, indisputable evidence that bovine tuberculosis is transmissible to children through contaminated meat and milk. The tuberculin test is a very reliable means of diagnosing tuberculosis in animals. There are three tests used, the subcutaneous, the intradermal, and the opthalmic.

When a veterinarian discovers a disease that is transmissible to man he should report it to the family physician; and when the physician has a case that he thinks may have been transmitted from the lower animals he should consult with the veterinarian. Working together in this way they could be of untold benefit to the community at large.

Musculature of hog with measle worm appearing on the cut surface.

Section of a measly hog heart.

We as veterinarians should cultivate the acquaintance of the M. D.s in our community and bring to their attention the possibility of transmitting disease from animal to man. Let us attend their county meetings, and get acquainted. My experience is that they are a mighty fine lot of fellows and always ready to meet us half way and give the glad hand.

B. ROYER.

Shawano, Wis.

## MAMMITIS YIELDS TO CAREFUL TREATMENT

A case of mammitis in a registered two-year-old Holstein heifer was reported by one of our Johnson County breeders, and upon examination I found a case of streptococcic mammitis present. (Diagnosis confirmed by a laboratory examination). The organisms had entered the mouth of the lactiferous duct, passing upward, infecting the mucous membrane of the duct and later the parenchymatous tissue of a considerable part of that quarter.

That the infection gained entrance from the exterior, seems to be verified, as the inflammation was ascending.

The heifer was in her sixth month of pregnancy, and to the owner's surprise the three healthy quarters were producing milk and about a pint was milked from each quarter. The heifer is still being milked, the quantity increasing daily. By careful milking of the affected quarter, several ounces of thick pus was removed. The quarter was then injected with a sterile saturated solution of boracic acid to which was added one-fourth of one per cent of lysol at a temperature of 105° F., when considerable more pus was removed. The heifer was given a dose of bacterin. The udder was bathed in hot and cold water alternately for thirty minutes, every two hours for three days. It was not massaged. The udder was injected the second day with the same kind of solution used at the first treatment and only a small amount of pus could be milked out. The third day all visible signs of pus had disappeared. A second dose of bacterin was administered on the second day and a third three days after the second, a fourth dose three days later.

The inflammation quickly subsided after the third day, and within a week no symptoms of mammitis remained, except that the fluid milked from the quarter was slightly watery, yellowish and sticky, while the other quarters were producing good milk.

Some objections may be raised in regard to injecting the lactiferous sinus with fluid of any kind, on the score that the fluid would carry the organisms into new and uninfected areas, which is possible and very probable, but in this case the pus was too thick to be removed entirely without dilution and no doubt there was some pus in small sacules that could not be dislodged with pressure. Therefore, some chances of infecting new areas were taken in order to remove all the pus.

In injecting an infected udder it is advisable to use only a small amount of fluid at a time. Then, without massaging, milk it out and repeat the process until all the pus is removed.

Care at all times should be taken as there is danger of injuring the duct or of infecting the other quarters.

Olathe, Kans. S. L. STEWART.

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## POISONING BY FUNGI

Many plants of this group are poisonous for animals. There is a disease which has been variously named by different investigators, practitioners and others, as food poisoning, forage poisoning, mold poisoning, blind staggers, sleepy staggers, cerebrospinal meningitis, etc., that has been known for a century at least and has caused wide spread devastation among animals. The so-called "Kansas horse plague" has been quite generally attributed to forage poisoning.

Sporadic cases of this disease are very common in all parts of the United States and at all seasons of the year.

Symptoms: The first symptoms noticed by the casual observer are depression, drooping of the head, closing of the eyes, difficulty in swallowing, staggering gait, walking in a circle, and in some cases pushing the head against the manger or a post. Paralysis follows and the animal finally goes down and dies within a few hours, or in some cases may live for several days.

Prevention: One attack of the disease does not immunize the animal. It should be an absolute rule among farmers and stockmen to never feed decayed, moldy or spoiled food to animals. Moldy ensilage, decayed potatoes, carrots, sugar beets, musty hay, and moldy corn stalks are especially dangerous.

Prevention is difficult in cases that occur on the open range or in grass pastures. The poisoning is presumably from fungi that develop on the grasses under certain climatic conditions. In these cases animals should be taken immediate-

ly from the pastures and fed hay that was cut the previous year or earlier in the season.

GEORGE H. GLOVER.

Ft. Collins, Colo.

## VETERINARY PROFESSION OF GREAT BRITAIN AND THE WAR

The war has done for the veterinary profession what it did for the medical profession; it raised it in the estimation of the world at large. It showed that no body of men and horses could be engaged in warfare without the service of trained veterinary surgeons and medical men, and such men could not be produced by a stroke of the pen by a Commander-in-Chief, like a million bullets, a thousand yards of barbed wire, or two hundred cannon, to be delivered in a month. The veterinary profession has been raised in the estimation of the world, and should be proud of the opportunity of proving its worth to the country and to the community. It was a great pleasure to the profession to know that some of the members who did such brilliant work came back decorated and honored, but all were conscious of the fact that they had done their very best for the country.—Col. Sir John Bland Sutton (Medical Corps) in *The Veterinary News,* London.

## MYRTOL AND EUCALYPTOL POISONING

Eucalyptol from myrtaceous plants to which the Eucalypts belong cause poisoning sometimes. Dr. Lowells F. Barker states that it is worth while mentioning that symptoms of poisoning have been recorded from these preparations.[1] Myrtol and eucalyptol are derivatives of myrtaceous plants. Eucalyptol poisoning has followed both overdoses and small doses of the drug, and it appears that some persons have an idiosyncrasy to it. Two different syndromes were noted in the after-effects: first, nervous system involvement with collapse; second, dermatitis. In the nervous type the patient became seriously ill shortly after the dose was administered. Vomiting, diarrhea and coma may follow. Vomiting should be induced to prevent further absorption of the poison. Skin lesions were often associated with the nervous lesions. Several fatalities have been reported from time to time. A greatly increased use of eucalyptol has resulted from its employment as a solvent for the Dakin solution, dichloramin-T. It would be interesting to know if any ill-effects have been observed from its use.

Dr. Flexner stated that Dr. Dakin and Dr. Dunham have discontinued its use on account of its irritating properties, and that they are now using paraffin as a solvent.

[1]Medical Record 94:171.

## PARTURIENT PARESIS OF RANGE COWS

This spring I have had occasion to note the effect of too rich feed on cows as regards to milk fever.

On March 7, 1920, I was called to see a sick cow that had given birth to a calf three days previously, and had been down for two days. She was a Durham and had run on the range most of her life, but had been milked some.

The diagnosis was milk fever and the usual treatment was given, but the animal never revived and died that night.

Four days later, on March 11, I was called to the same ranch and found another cow of the same breed down, that had given birth to a calf the day previous.

The diagnosis was milk fever, although this cow was strictly a range animal and had never been milked. She had been down but a short time, but was completely paralyzed, and forty-five minutes after she was given the treatment, she was on her feet and we had to move.

Thinking it rather strange that range cows should have milk fever, I inquired about their feed. These two cows and one other pregnant one had been fed with a bunch of beef steers that were getting the following ration:

Soy-bean meal, 4 lbs.
Cotton-seed meal, 2 lbs.
Shorts, 8 lbs.
Rolled oats and barley, 8 lbs, with roughage.

Since milk fever in range cows is new

to me, I thought the report might be of interest to other practitioners.

FRANK E. EAMES, D.V.M.

The Dalles, Oregon.

## RELATIVE VALUE OF VARIOUS GERMICIDES

The army veterinary service has reported some interesting research work on the relative value of some certain germicides, from a test on B. necrophorus.

In this investigation, necrotic tissue containing large numbers of B. necrophorus was taken from a rabbit suffering from necrophorous infection experimentally induced. The tissues were emulsified in a sterile mortar with sterile normal salt solution and injected subcutaneously into normal rabbits. The lesions produced in the rabbits reached their height on the fourth day, at which time the rabbits were killed and infected areas of the abdominal wall removed, and emulsified as before in sterile water with approximately 25 cc. of sterile normal salt solution. The resulting emulsion was filtered through sterile gauze, removing any part of tissue not emulsified. Stained smear preparations of this emulsion demonstrated large numbers of B. necrophorus.

Of this emulsion 2 cc. were placed in each of five sterile cotton stoppered test-tubes, to which were added as follows:

Tube No. 1—5 cc. of a 1 to 5000 dilution of bichlorid of mercury.
Tube No. 2—5 cc. of a 1% solution of phenol.
Tube No. 3—5 cc. of a 1% solution of Liq. Cresolis Comp.
Tube No. 4—5 cc. of a 1% solution of acetic acid (c. p.).
Tube No. 5—5 cc. of sterile NaCl solution (for control).

The tubes were allowed to stand at room temperature for twenty minutes and were then placed in the centrifuge and centrifugalized at high speed for twenty minutes. The supernatant fluid was drawn off from the tubes, and to each tube was added 5 cc. of sterile NaCl solution. The tubes were then well shaken until the packed material at the bottom of the tubes was thoroughly mixed with salt solution. Stained smear preparations from each tube demonstrated the B. necrophorus in large numbers.

Five rabbits were then injected as follows:

Rabbit No. 1—2 cc. of the suspension from tube No. 1.
Rabbit No. 2—2 cc. of the suspension from tube No. 2.
Rabbit No. 3—2 cc. of the suspension from tube No. 3.
Rabbit No. 4—2 cc. of the suspension from tube No. 4.
Rabbit No. 5—2 cc. of the suspension from tube No. 5.

The injections were all made subcutaneously on the median line of the abdomen.

### Summary

Control rabbit (No. 5) died in five days, showing an extensive lesion.

Rabbit No. 1. (Bichlorid mixture) Died in six days; extensive lesion.

Rabbit No. 2. (Phenol mixture) Died in thirteen days; lesion developed very slowly but had an extensive involvement at time of death.

Rabbit No. 3. (Liq. Cresolis Comp. mixture) Developed a small lesion from which it is recovering.

Rabbit No. 4. (Acetic acid mixture) Developed the smallest lesion of the five animals injected, although the smallest rabbit, and will survive.

## PERIODIC OPHTHALMIA OR AMAUROSIS

I was called to see a mule colt six weeks old, which had been sick a few days before with impaction, and was treated by the owner with rectal injections of warm water and soap suds. The colt recovered, but owner noticed a day or two later, following the attack of impaction, that this colt seemed to run into the fences, barn or any object in its path; and was apparently blind.

I made a thorough examination of the colt, and found the pulse normal, respiration normal, temperature normal. The colt seemed to feel fine and would eat and suckle.

The eyes were covered with a milky scum. There was no discharge from the eyes and the owner stated that there never had been. I left a solution of boracic acid and distilled water to be injected into the eyes two or three drops once a day.

The colt's eyes are cleaned up and look normal, but the blindness still continues.

I would like to hear through the JOURNAL, from some one who had had sim-

ilar cases, as to what the probable outcome will be.

The mother of this colt has good eyes, as well as the jack, to which she was bred.

Kans. A. L.

## DIFFICULTY IN DIAGNOSING INTESTINAL DISPLACEMENT

Displacement of the intestines? Invagination? Torsion? Where, where, O WHERE? How do we know? How do we tell? Peculiar postures, peculiar antics, peculiar sweats, etc. Yes, that's true, all right, but how do we tell where? There is over a hundred feet of intestine to deal with and all subject to these ailments. And if we have a displacement in any part of it, what is our refuge? I mean from the scrutiny of the owner, who has the case at heart as we never will have. What could we do if we knew just where the trouble was?

We are called to see a fine horse suffering from intestinal displacement somewhere along the canal. Old Quack so and so has been there before us or will in all probability follow us. Look out, now! Talk about pitfalls. You know we don't pride ourselves on staying all night in the fodder to see what the dose is going to do. We pride ourselves on diagnosing, prescription, prognostication and instructions. If good luck or hog luck don't relieve our case we're all out of luck and headed for a funeral, aren't we? All we have to do is to make the case clean cut, a case of diagnosis or else lie around until death closes the case, then follow it to the knacker and fuddle the stink-farm man out of the true nature of the thing in its entirety. Otherwise we make a stab at the prognosis, a guess at the lesion and postmortem findings and go our way—only to be followed by old Doc So and So, who doesn't know one thing about the interior of the horse, and his decision is different from ours, of course—and the bystanders, of course want to hear something different—and all must pan out exactly as we say, or else our name is Dennis. Well, how are we to steer clear from this supposed pitfall?

Let me ask, what student was ever taught the true sounds of the horse's bowels in a college? Who ever spent ten hours in his whole life listening to the natural sounds of many different horses' bowels? Can you differentiate the sound of a full bowel from an empty one? A diseased one from a healthy one? Do you know that the peristaltic wave starts from the pylorus and proceeds to the rectum, if all is well? Could you tell if the wave struck a diseased portion or not? If not, why not?

Prepare yourself to judge your case to a certainty, by a study of the sounds and their locations and their indications, so as not to blunder in your prognostications. This takes hours and hours—yes, days—to accomplish. Before we can tell the diseased, we must become acquainted with the normal, and to do this we will have to listen, listen and listen, until we are called cranks.

J. W. HARBAUGH.

Corydon, Indiana.

## DAUBENTONIA LONGIFOLIA

The Department of Agriculture reports this plant, which has no popular name, as poisonous to sheep and goats. It is found in the southern states, particularly in Texas, and belongs to the locust and mesquite family.

The flowers are scarlet to yellow, and the pods have four wings, with the seeds separated.

As far as has been determined, the seeds, as in lupine, seem to contain the toxic properties, and no harmful effects have been observed from eating the green plant. An ounce of the seeds may cause death.

In general, about twenty-four hours elapse after the seeds are eaten before any symptoms appear. In mild cases, the animal becomes dull, and diarrhea is present. In severe cases, great weakness takes place; respiration is labored, and the animal dies without much struggling.

So far, no successful lines of treatment have been worked out, prevention being the most important factor. Laxatives have been given with indifferent success. As in all cases of toxic plants, if the animals have some food in the rumen before eating the seeds of this plant, less absorption takes place. Any of the antidotes may be

tried, and the future will undoubtedly bring forth a successful line of medication.

Moscow, Ida. E. T. BAKER.

## MENINGITIS FATAL TO TOY SPANIEL

This case of meningitis is reported because of its exceeding rareness in small animals, and because of the etiological factors in this particular case.

On Feb. 5th, I was called to see a toy spaniel, two and a half years old, that had been in excellent health during the two preceding years, but previous to that time had had two or three attacks of convulsions, that I attributed to too harsh douching of the ears in the treatment of canker, which has since been treated by the use of bromids and milder and less irritating irrigations—blood-warm instead of cold.

In the latter part of January, the owner noticed that the animal was very restless one night, but the next day it seemed to be entirely well. The restlessness continued, however, on succeeding nights, the animal constantly changing from place to place. The owner stated that examination and handling seemed to cause pain in the abdomen. In a few days the animal became listless and its appetite was diminished. This condition had been present for a week or so, when my first visit was made, the animal being under treatment for constipation, as directed by another veterinarian. The abdominal pain had become more constant, but was never severe or accompanied by moaning, but a particularly marked drawing in was noted, probably due to active contraction of the abdominal muscles.

Among the symptoms noted were constipation, scantiness of urine, rise in temperature, staggering, dragging gait, which doubtless resulted from irritation of the vagus region.

The animal vomited intermittently from about the seventh to the tenth of February, when the irritability of the stomach responded to bismuth treatment, and there was no recurrence of the vomiting.

This vomiting may have been the result, at least that was my opinion, "of irritation of the brain of various kinds especially noted in meningitis."

About February 7th, the respiration was first observed to be irregular and sighing, and the pulse intermittent. These symptoms, so tardily developed, were the first I noticed indicating cerebral disease.

The animal would lie most of the time with its eyes closed. The pupils responded, however, to light in the usual manner in this case (at night with a flashlight) till near the time of death.

He had no convulsions after milder drugs and methods were introduced in the treatment of the canker of the ears and he recognized his master when spoken to, till near the end. He died February 17th, nearly three weeks after the inception of the disease, and ten days after the first symptoms were noted, which were clearly referable to the brain. Toward the end there seemed to be some contraction of the neck, and the head seemed to be drawn forcibly backward.

OSCAR SCHRECK, V. S.

New Haven, Conn.

## BEST TO QUALIFY YOUR PROGNOSIS

I was called by phone to come in haste to see a horse that was acting strangely, having staggered along perhaps one hundred yards and gone down.

The subject was a grey gelding about six years old, weighing near 800 pounds. When I arrived, I found him on his feet in the hallway of the barn, eating fodder, leaning somewhat to one side, excitable, temperature subnormal.

The owner and a colored boy had treated him before I arrived, and with plenty of help, put him on his feet and by holding him up on both sides, got him back to the barn.

They stated they had treated a number by the same process in previous years and never lost one if they acted promptly. The treatment consisted of splitting the skin of the forehead longitudinally, and with a wooden paddle loosening the skin from the underlying tissues over the eyes and up nearly to the ears. The cavity so formed was then filled with table salt and fresh ground black pepper.

One might have decided it was injury and gradual recovery, but he seemed to have real staggers and the corn that was being fed looked fit to stagger a hog.

I administered a purgative and told them

he would die. I felt superior to the treatment.

The horse has become nearly normal again.

Michigan City, Miss. W. O. NEY.

## SOME OBSERVATIONS ON CESAREAN SECTION IN SOWS

Various methods and procedures have been given in the Journal for the cesarean oepration on the sow. It is true that various roads lead to Rome, but the one presenting the fewest angles and detours is the one to be preferred.

Some have advised against operation when laceration of the parts has been caused by the use of instruments, and again the advice has been given not to use chloroform. I wish to chronicle just four of the many cases of cesarean operations successfully performed on sows varying in value from $26.00 to $600.00, and to give in conclusion a series of "do's" and "don'ts" which were gleaned from a loss of twenty-eight sows from the cesarean operation.

Case I. April 9, 1919. A five-hundred-pound Poland China could not deliver her pigs. The owner used forceps. Cesarean operation was performed by the light of a kerosene lantern under a straw shed and in rainy weather. No anesthetic was used, since I had all the help needed. The usual routine of asepsis as recommended by the best authors, was practiced. One dead pig was removed and another monster, the head presenting two well developed snouts, one eye on each side and one in the center, was removed. No stitches were taken in the horns, but a deep suture taken on the flank. The sow lay down for three or four days, and then got up and was soon well and was sold to the butcher.

Case 2. On the 21st of last April, I was called to a sow that could not deliver her pigs. With the aid of pituitrin and manual assistance, one pig was secured. Time was given to the sow to help herself, but to no avail, although she was straining very hard. Hand exploration revealed no pig within reach. Cesarean operation was performed. The sow was anesthetized first with chloroform and later with ether. The left side was washed, shaved, dried and washed with spirits of ether, then tincture of iodin. The incision was made wide enough to insert the hand. Only one pig was present. The sow recovered.

Case 3. May 7th, a valuable Hampshire sow was in labor. A neighbor farmer with a great record of ability in veterinary midwifery was asked to assist the sow in her difficult confinement. Mr. George came with his prongs and a great chew of tobacco. One pig and then another one was delivered. Mr. George was wringing wet with sweat. The third pig came, hind feet first. The tail and feet were torn until there was nothing left to grasp. The owner became uneasy and telephoned for me to relieve Mr. George. Mr. George was "sore," and he commenced to enumerate his brilliant past performances. "You know," said he, "how I relieved Nick Johnson's sow of all her pigs although it took me the whole day, and if the sow died it was not my fault." "I don't want my sow to die and this is why I got Doc here," said the farmer.

Cesarean operation was performed immediately. The horns were stitched with catgut after removing all the dead pigs there were and the fetal membranes. By the time the last stitch was made the sow was on her feet. The lacerated membranes from the inhumane use of the forceps were washed with antiseptics, and the hanging shreds trimmed. The owner informed me three weeks later that the sow was doing well. I purposely asked, as I have had cases where the sow was neglected and she died three days after the operation.

Case 4. On the 12th of May, a four-hundred-pound Poland China sow, very valuable, could not deliver her pigs, although she was straining violently. Although I had the needed assistance, I chloroformed her and relieved her of six living pigs. The sow did not get up for three days, and the pigs sucking with all their might. The owner greatly feared that the mother might die. But she got up and is at this writing nursing all her litter.

Instead of enumerating more cases, I shall give the "do" and the don'ts" which made me change my tactics until finally I decided on the one which is giving me the best results.

I commence the chloroforming myself and in this manner. I take a clean piece of cloth and put it in the bottom of a clean cup in which I have two ounces of spirits of niter (a substitute for alcohol). On this cloth I pour about one ounce of chloroform and make the sow inhale. I have one man holding the front feet, who finishes the giving of the anesthetic and one man holding the hind feet who also assists by handing me what I need. I have my razor always sharp. The water for shaving contains lysol. After shaving the field I dry the side to make sure that a hair does not stick to the side. Then I wash again with niter and iodin and dry the area. With hands scrupulously clean, I make the incision parallel to the spinal column about four or five inches from the mammary glands. I take a clean piece of bed sheet, fold it a few times, and make a cut in the center, similar to that in the animal. I pull the horn out and lay it over the clean cloth and quickly remove all the pigs, closing with Lambert stitches with catgut. If my hands are soiled from the decomposing pigs or membrane, I wash them quickly before beginning on the second horn. Undoubtedly many other operators use the same procedure but I have not seen it described. I credit much of my success to this precaution.
In only two of the cases mentioned, the uterus was not lacerated.

I learned from these various operations that the earlier the operation is done and the less time it occupies the better the results. That forceps without exception are harmful. A wire bent on one hand is more beneficial.

As yet no one has mentioned the feed. I believe I lost some cases because I didn't advise what to feed. I believe in very little feed and that little should be thin slops. Skim milk or very thin and lukewarm shorts is best.

I always advise that the sows be kept in a dry place.

Of the numerous cases I have handled, I never had suppuration in the incision and I use absolutely no disinfecting powder or wash after the operation. I have the site of the operation clean and dry.

The bladder, without exception, is always full and sometimes during vaginal manipulation and due to the forceful straining from the action of the pituitrin the sow micturates. Light sows usually walk away immediately after the operation. Heavy sows, so far as my experience goes, never get up before the third or the fourth day.

S. J. ALCALY, D. V. M.
Fairfax, Minn.

## THE NEWER CONCEPTION OF VETERINARY SERVICE

The idea of a veterinarian as a commonplace doctor who attends to the pains and aches of domestic pets and is called in when the farmer's horse is indisposed, is vanishing. Even the layman is beginning to realize the comprehensive social importance of the study of veterinary medicine. He is learning that the veterinarians in this country and abroad have accomplished invaluable work toward the prevention of animal disease and sanitary control work among animals, all of which has a decided and obvious effect on the general public health. One of the surest causes of disease among human beings is the consumption of disease germs in the food eaten. The study of veterinary medicine operates toward eliminating diseases of all domestic food animals and fowls and thereby tends to lower the death rate among human beings.

It lies within the scope of the veterinarian to prevent the transmission of animal diseases like rabies, tuberculosis, anthrax, glanders, many parasitic diseases internal and external to the human family by contact and the consumption of food. The conservation of the live stock, which is a primary function of the school, makes every man, woman and child the profession's debtor. It may be in milk, it may be in meat, or wool or leather, or even in cereals nurtured and fostered by the farm animals. Faithful veterinary medicine helps guard the human race from epidemics.

The United States, with a ten-billion-dollar livestock industry, is suffering today from the want of a sufficient number of trained veterinarians. Many of our men are prepared to deal with the pressing problem of animal husbandry, which hitherto has resulted in an enormous loss from preventable diseases

alone. Some conception of the economic value of veterinary service to the live stock interest and to the public may be appreciated by the fact that government experts place the amount of loss from diseases of live stock at $200,000,000 annually. Tuberculosis in cattle and hogs alone causes an annual loss of $40,000,000. Hog cholera causes a loss of fifty million dollars annually.—*Bulletin*, New York University Veterinary College.

## ANESTHESIA IN BOVINES*

### Position of the Patient During Administration of Chloroform

I cast a cow that has horns, without hobbles, as the horns are apt to be broken during the fall. I put a rope around the horns, a half-hitch around the body behind the elbow and another around the body in front of the mammary gland. A steady pull on the rope brings the animal down. I then take a number of bundles of straw—previously prepared—and pack them from behind the withers and along the neck to the head. It is not necessary to place the cow on her sternum, but in a position midway between lying flat and lying normally. This prevents her from swelling as gases always accumulate in the rumen when a cow lies on the side for a considerable time or even for a short time. The head is allowed to rest on the bundles of straw, the normal angle being maintained as nearly as possible. I do not fill the bags tightly with straw as the lower horn is apt to penetrate them. The attendant administering the chloroform kneels and holds the upper horn.

### Method of Administration

My first method was to pour the chloroform on a piece of flannel or lint stretched across a metal mask of the human pattern. This was held over the upper nostril with one hand, and the under nostril closed as desired with the other hand, so that the vapor was inhaled through one nostril only. This was a costly and tedious process as it always took, even under the most favorable circumstances, twenty to twenty-five minutes to place a cow completely under anesthesia, and the quantity of chloroform used was from four to six ounces. If the animal had to be kept under for a considerable time there was little left of a two-pound bottle. It was a safe method for the cow, but a sickening job for the man at the head.

For some years I have used a Hobday mask. It is applied to the cow the same as it is applied to the horse; only I do not interfere with the tongue, nor do I bundle a rug around the mask. The attendant steadies the head by the upper horn.

After the initial struggling, a cloth may be laid over the mask if the animal is in the open. One and a half ounces of chloroform sprinkled on cotton wool and placed in a Hobday mask is usually sufficient to anesthetize a cow in ten to twelve minutes; by applying two-dram doses occasionally the animal may be kept under as long as is necessary.

In a case of difficult parturition, which I anticipate will last a considerable time, I administer one ounce of chloral hydrate prior to applying the mask with the chloroform. The chloral I dissolve in two ounces of warm water and mix with ten to twelve ounces of milk to make a drench.

My reason for giving chloral is that the mask can be removed after two ounces of chloroform have evaporated, and the chloral is sufficient to keep the animal quiet enough for all purposes for a long time. The advantages of the Hobday inhaler over the old method are:

1. Easy administration.
2. A small quantity of chloroform can be used.
3. The animal is quickly anesthetized and much time is saved. I have so far had two deaths when operating on cattle under chloroform, but in each case the cause of death was accounted for upon postmortem examination and could scarcely be attributable to the use of the anesthetic.

The first case, a steer upon which I was operating for pelvic hernia, died when I was putting in the last stitch.

This animal had been ill for days and had been given several doses of purgative by the owner. It was in an advanced stage of peritonitis, and the amount of

* The Veterinary Journal, Vol. 76, No. 3.

chloroform administered was only two ounces.

The second case was an aged shorthorn cow, in fat condition, with an everted uterus.

As I got to this animal early and the uterus had been supported in a clean sheet, I attempted to return it without chloroform. After much straining, I had it almost in place three or four times, but each time it everted again. I then decided to use chloroform and applied a mask and one and a half ounces of chloroform. In about one and a half minutes the animal was dead. My only regret in this case was that I did not use the chloroform to begin with, as the patient had become very much exhausted.

ALFRED J. MILLIGAN, M.R.C.V.S.
Annan, Scotland.

## NAIL-PUNCTURE OF DIAPHRAGM

In the April number of your masterful publication, I was much interested in two short articles, viz., "Traumatic Pericarditis" and "Death Results from Nail Puncture, etc.," by S. W. Haigler, D. V. M., Bellflower, Ill.

I have had several cases of foreign bodies in the dog, such as hatpins from four to nine and one-quarter inches, pieces of lead, rubber balls, nails of every variety, pins, needles with and without thread, but it was only recently that I encountered my first case of this kind in a valuable Holstein.

The animal died without a struggle a few minutes before I arrived at the farm. The "boss" said that he thought the calf she carried was still alive. I immediately opened the abdominal cavity and delivered a large bull calf that gasped a few times and died.

This cow was due to drop her fourth calf May 20th. On the 2nd of May, while being led out of an ideal barn, up to date in every respect, the cow slipped and fell but got up quickly and moved about and seemed to be all right. On the morning of the 5th, she did not lie down or eat much. She was given a dose of epsom salts, and according to the owner, "commenced to act as if she were going to calve." This was the day before I was called. I found the signs of impending parturition in the intestinal peritoneum and in the mesenteric glands I found tubercles of calcined cysts.

When I pulled out the reticulum I found two ten-penny wire nails protruding through the diaphragm. There was no fluid or endocarditis, only peritonitis where the punctures occurred. Presumably when she fell these punctures were made. This cow with the others was certified and accredited. She had passed five tests, but still had plenty of lesions.

L. T. DUNN.

Providence, R. I.

## THE MIGRATING COURSE OF ASCARID LARVAE IN THE BODY OF THE HOST*

In Journal of Parasitiology, 1919, Sept., Vol. 6, No. 1, p. 19, Yoshida (Sadao) describes experiments performed with the object of ascertaining the exact course of migration of Ascaris larvae in the host.

Two sets of experiments were made (1) by injecting larvae into the body of the animal, and (2) by feeding with ripe eggs. In the first set the migratory power of the larvae was examined chiefly, and in the second the natural course of migration was observed. The larvae were obtained by triturating and extracting infested livers or lungs.

It was found that larvae injected into the pleural cavity of guinea pigs penetrate into the lungs directly, while those injected into the abdominal cavity penetrate into the liver or pierce the diaphragm to enter the pleural cavity, and thence reach the lungs. These results demonstrate the great power the larvae possess for boring through various tissues. It is possible that some of the larvae may reach the lung by way of a blood-vessel, but appearances indicate that the majority proceed directly by piercing the diaphragm.

The result of a considerable number of feeding experiments on guinea pigs showed that larvae hatched out in the intestine immediately proceeded to the abdominal cavity by piercing the intestinal wall. They then wandered about freely

*Tropical Veterinary Bulletin, Vol. 8, No. 1.

in the peritoneal cavity, entering the liver, spleen, pancreas, or kidneys, while others pierced the diaphragm, entered the pleural cavity, finally entering the lung. Thus, it is believed that the larvae migrate in every direction, boring through various organs or tissues by means of their own power of piercing and are not carried along passively by way of the blood-vessels. The liver and the other organs in the peritoneal cavity are not considered to be necessary or important organs to be passed through. The lungs are the only essential organs to be traversed by the larvae in the course of their development. In this organ their stay is longer than in any other, and their development is rapid, and they reach a length of from 1.7 to 2 mm., in guinea pigs. They then migrate to the mouth cavity through the trachea, and afterwards pass down the alimentary canal to the intestine of the host.—*Experiment Station Record.*

## AN OBSERVATION ON THE CASTRATION OF FARM ANIMALS*

Recently I had the opportunity of watching the castration and spaying of some farm animals by a practitioner in the Eastern Counties, and although I know that the time taken is nothing very extraordinary, I also know that only a comparatively small proportion of our present-day college students have ever seen such demonstrations of dexterity. We ought not to have the idea that such are beneath our notice, as, if so, these operations are allowed to become the nucleus of the unqualified practice of the quack, who gains his foothold in a district by his expert performance.

The first batch consisted of eight male pigs, each seven weeks old, all of which were caught by a farm hand and disposed of within three minutes, the actual operating part taking 61 seconds; an average of less than eight seconds each. Three were timed at four seconds each.

Four female pigs of the same age averaged forty seconds each from the moment the incision was made in the flank until the wound was sutured.

In each case the animal walked away afterwards apparently quite unconcerned.

A six-weeks-old bull calf took thirty-five seconds, and a two-year-old colt, with the help of one farm hand only, took two and one-quarter minutes to place the clamps on and remove the testicles.

FREDERICK HOBDAY, F. R. C. V. S.
London, England.

*The Veterinary Journal, Vol. 76, No. 2.

## DOES NOT FAVOR ABLATION FOR SHOE BOILS

In re the "Total Ablation of Shoe Boils" in the April Journal. To take issue with Dr. Merillat is indeed presumptuous. I have watched his wonderful technic and, indeed have always used him as an illustration of what a veterinary surgeon ought to be.

I have tried ablation and have never succeeded in obtaining the cosmetic results desired, possibly on account of poor technic.

Here is a method I much prefer. Seton the cyst, fill it with undiluted tincture of iodin, squeezing most of it out in a few minutes, that is, all at the first dressing.

In forty-eight hours curette the cyst wall thoroughly and again use the iodin. Wash out the wound from day to day with a mild antiseptic *pro re nata.* For a few days the swelling increases, then gradually diminishes. If it becomes stationary, curette again if necessary.

Keep the seton in situ until the swelling reaches its minimum, then remove. Ablation of the remaining fibrous mass is then easy, and quite often there is little left to remove.

THOS. B. ROGERS, D. V. S.
Veterinary College, N. Y. University, N. Y.

## DESTRUCTION OF BUGS BY FUMIGATION*

For the destruction of bugs (Cimex) with hydrocyanic acid gas, the quantities that have been found efficient for one thousand cubic feet are:

| | |
|---|---|
| Cyanide, | 1 pound |
| Sulphuric acid | 1 pound |
| Water | 3 pounds |

*Agricultural Gazette, Sidney, N. S. W.